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LIVESTOCK FEED PROCUREMENT

FEED CROP PRODUCTION AS SEPARATE BRANCH DISCUSSED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 2, Feb 81 pp 50-64

[Responses from readers to the article by Ye. Kiveysha entitled "Organization of Feed Crop Production," published in EKONOMIKA SEL'SKOGO KHOZYAYSTVA, No 7, 1980: "Problems in Development of Feed Crop Production"]

[Text] The draft of the "Basic Directions of USSR Economic and Social Development Over the Period 1981-1985 and up to the Year 1990," which the CPSU Central Committee has prepared for the 26th party congress, points up the need "to treat feed crop production on kolkhozes and sovkhozes as a specialized branch. Particular attention is to be paid to the adequacy of a farm's own livestock feed."

We are publishing below the responses of readers which have come in concerning the problems of organizing feed crop production as a unified national economic system, which were discussed in the article of Ye. Kiveysha entitled "Organization of Feed Crop Production," which was published in No 7 of our journal for 1980. Setting up such a system requires concerted and coordinated efforts at the level of farms, rayons, oblasts and republics. Continuing the discussion already under way, we offer for the attention of readers articles on improvement of the organization of work in feed crop production both within the farm and in the interfarm organization and concerning the problems of developing the mixed feed industry.

On Organizational Forms in Feed Crop Production--N. Stepiykh

Ye. Kiveysha mentions in his article entitled "Organization of Feed Crop Production" (No 7, 1980) that feed crop production has become a bottleneck not only in agriculture, but indeed in the entire agroindustrial complex. The measures proposed to improve the organization of feed crop production make it possible to pay greater attention to this branch at all levels and to improve management of all elements of this complicated system.

But not all of the author's principles, valid as they may be for the conditions of Belorussia, will be applicable in other regions of the country. For example, Comrade Kiveysha considers it necessary at the level of individual kolkhozes and sovkhozes "... to set up a permanent work collective of feed crop production workers, to assign them an area of farmland, equipment, storage facilities and enterprises for feed preparation, that is, to single out the production of feeds as an independent branch."

Under the conditions that prevail beyond the Urals there are a number of reasons why feed crop production cannot be completely separated from the economic and organizational standpoint. The work processes in feed crop production and in other branches are not concurrent. For instance, from mid-June to mid-August, when feed crops are being harvested on a large scale, operations have practically ceased in grain production, and when grain harvesting begins, there is a considerable drop in the amount of work in feed crop production. Agriculture is experiencing a shortage of a large amount of labor resources, as indicated by the fact that many kolkhozes and sovkhoses enlist a sizable number of machine operators from the city for planting and harvesting. It is equally important that alternating grain and feed crops is a mandatory condition of proper soil and crop practices. Setting up crop rotation confined to grain crops will result in a smaller grain harvest.

All of this necessitates that one and the same work collective participate both in grain production and also in production of feed crops, and it does not allow permanent sections of farmland to be assigned to the specialized subdivisions.

Only partial specialization of feed crop production within the farm has become widespread for all practical purposes on the farms of Kurganskaya and Chelyabinskaya oblasts. It takes three basic forms depending on the size of the farm.

Within the administration of large kolkhozes and sovkhoses a feed crop production division has been created; as a rule it is headed by an agronomist with the status of a deputy chairman or farm director. Within that division there are also an engineer for feed processing and a hydraulic engineer. The shops where the feeds are artificially dried, feed processing installations and irrigated land are under the direct management of the division. When feed crops are being harvested, manpower and equipment are transferred to the division. The division's specialists organize work detachments and provide all further management of the entire operation. The division's most important function is planning development of the farm's sources of livestock feed.

On small kolkhozes (up to 6,000 hectares of farmland) which have a single settlement, "dual" specialization has become common: specialization on the basis of the end product and specialization with respect to the type of equipment. On such farms the chief agronomist is responsible for the land. He has two teams under him: one of them is specialized in feed crop production and the other in the production of grain. Light equipment (MTZ-type tractors and machines designed to operate with those tractors) is concentrated with the first team, and the heavy equipment (crawler tractors and the K-700 with appropriate machines and also grain-harvesting combines) are attached to the second. It goes without saying that neither of these teams is solely confined to its own product (feed or grain). The team with light equipment applies fertilizers over the entire area and treats crops with herbicides, and the team with heavy equipment does the fall plowing and plows fallow land, hauls the organic fertilizers, participates in bringing in the silage, and so on. This kind of organization enhances responsibility of the collectives for the end product and improves the technical servicing of machines.

In the third organizational form land, manpower and equipment are assigned to the feed crop production branch. But even in this case the branch is not relieved of

grain production, and the other subdivisions are not relieved of raising feed crops. But all the feed-harvesting equipment is concentrated in the feed crop production branch, which makes it possible to harvest feed in all the subdivisions of the farm on a centralized basis and with progressive methods.

Consequently, at the farm level practice is finding more flexible forms of organizing feed crop production.

At the level of the rayon and the oblast Ye. Kiveysha recommends "... setting up a specialized branchwide system for management of the agroindustrial complex of forage production in the form of a production administration for feed crop production with a permanent management staff."

Target-program methods of planning and management are needed to provide better coordination of the effort of enterprises in different departments to raise the quality and increase the volume of feed crop production even more than at the level of individual farms. These methods do not necessitate mandatory subordination of all enterprises related to feed crop production to a single management entity, that is, creation of an association for feed crop production. Often this is simply impossible. For example, a majority of state mixed feed plants are not separate enterprises, but shops associated with elevators, flour-milling combines, and their technology is tied in with the rest of the production operation. On the sovkhozes of the associations Ptitseprom, Svinoprom and Skotoprom feed crop production is the only plant production.

At the same time the coordination of all the elements in the system of feed crop production is an indispensable condition for building a solid foundation of feed crop production for livestock raising. In our view, then, the target-program method of managing field crop production at the level of the rayon could be applied by setting up a feed crop production division within the rayon agroindustrial association.

As shown by the experience that has been acquired in the country, rayon agroindustrial associations combine most fully within themselves the principles of regional and sectoral management and make it possible to unify the efforts of different enterprises for the efficient operation of all sectors in the rayon. In such an association the field crop production division must be assigned the duty of drafting a comprehensive program for development of sources of livestock feed in the rayon and for implementing that program. Within the rayon's organizations and enterprises involved in the production of feed crops there must be corresponding divisions or key personnel responsible for carrying out the program. From the functional standpoint these entities should be subordinate to the rayon feed crop production division, but administratively they would be subordinate to the supervisors of their own enterprises. Management of feed crop production at the oblast level should be organized approximately according to the same principle.

Management of Feed Crop Production in Odesskaya Oblast--M. Limonis

Following the July (1978) Plenum of the CPSU Central Committee, a definite effort was made in Odesskaya Oblast to create sound sources of livestock feed and to

bolster it in terms of organization and equipment. Plantings of perennial grasses, legumes, and corn for grain have been expanding. The volume of the harvesting of all types of livestock feeds and their industrial processing have grown considerably. Within the oblast 17 rayon interfarm production enterprises for feed crop production have been created, there are 26 interfarm mixed feed plants and livestock feed combines in operation, and 30 kolkhozes specializing in feed crop production have been designated.

The diversity of forms of the production subdivisions, the differing levels of specialization and concentration of production necessitate straightforward linkage of all components in feed crop production and make management more complicated, which often has an effect on production performance.

At present the system for management of feed crop production in the oblast is represented by a variety of services, subdivisions and individual specialists which are not brought together by a unified structure of management entities at the levels of the oblast, the rayon and the kolkhoz. This results in a multiplicity of different connections, both vertical and horizontal. Coordination of their activity and ensuring the normal functioning of the system require great efforts on the part of the management staff and are frequently accomplished to the detriment of production performance itself.

A number of measures to improve the organizational structure of management of feed crop production are now being carried out in the oblast.

An oblast production association for seed crop production and the mixed feed industry has been created. There are the following divisions within the association: feed crop production and the laying by of feed, the mixed feed industry, the technical division and the support service group--19 people in all. The association coordinates and supervises the work of rayon production associations for feed crop production and the mixed feed industry, interfarm mixed feed plants, livestock feed combines, enterprises for feed crop production, and also the organization of feed crop production on farms.

Creation of the association opens up an opportunity to link the productive activity of enterprises into a unified production and economic complex.

Rayon production associations for feed crop production and the mixed feed industry are being organized in rayons from interfarm mixed feed plants, enterprises for feed crop production and specialized kolkhozes for production of livestock feed.

The production activity of the enterprises making up the association has its own peculiarities. For instance, the enterprises for feed crop production (the former agrochemical associations) perform the operations of applying organic and manufactured fertilizers to feed crops on the farms. As the feed and forage crops mature, and in accordance with the contracts concluded, they are transported to mixed feed plants for processing. Once these enterprises are furnished feed-harvesting equipment, they are to be assigned the areas of land on kolkhozes for feed crops, which they would harvest and transport for processing. The interfarm mixed feed plants and their branches on kolkhozes process the customer's raw materials, mixing in the

protein-vitamin and mineral additives allocated from funds, as well as other components they produce themselves.

And finally, the association includes farms specialized in feed crop production; they are to become the base farms and model farms on matters of feed crop production and are to ensure production of the necessary amount of vitaminous-grass meal and other valuable raw materials necessary for enriching mixed feeds.

On the basis of further intrafarm specialization and concentration of feed crop production on kolkhozes, specialized production subdivisions have been created and are in operation--units, teams, detachments which are assigned the appropriate feed crop harvesting equipment. Supervisors of these subdivisions stand in functional and line subordination to kolkhoz deputy chairmen for feed crop production, positions which are being created in all the kolkhozes of the oblast.

Thus a unified system is being created for organizing and managing feed crop production as a specialized branch of the economy, and this will undoubtedly help to improve the efficiency of its operation.

Improving the Forms of the Organization of Work in Feed Crop Production--V. Mel'nichenko and L. Mel'nichenko

Teams within tractor and field operations crews are the principal form for the organization of work in feed crop production on the kolkhozes and sovkhoses of the Nonchernozem Zone of RSFSR. In this organization of work principal attention is paid as a rule to food crops; feed crops are given the worst land, they are the last to get applications of fertilizer, in periods of strenuous field operations manpower and technical resources are once again distributed to the advantage of the food crops, and so on. On most farms optimum feed crop rotations have not been adopted, the fields where feed crops are grown consist of small plots scattered over the entire area of the farms. The teams for feed crop production are not permanent; as a rule they are disbanded when the season comes for harvesting food crops. This in fact relieves these work collectives from responsibility for the final results of their work.

It goes without saying that management of production becomes more complicated under such conditions, and the introduction of equipment with all the power required and progressive forms of organization of work is held back. Mechanized detachments have recently become widespread in feed crop production. The principal tasks of these detachments is to harvest feed crops on time. But the detachment form of the organization of work is temporary, which is why it cannot solve the principal problem of increasing the production of livestock feed.

As shown by the advanced practice of kolkhozes and sovkhoses in the Nonchernozem Zone of RSFSR, the specialized team is the most progressive form of the organization of work for specialization and concentration of feed crop production within the farm. The entire area of feed crop land, the necessary equipment and experienced machine operators are assigned to the team. The specialized feed crop harvesting team is an independent cost-accounting production unit. This is a unified work collective whose task is to raise, harvest and store high-quality feeds with

the lowest outlays of labor and resources. The members of the team operate according to a plan which states the amounts and deadlines for production of feed crops, their quality, outlays of manpower and materials, remuneration and material incentives for the results of production.

The team consists of specialized units and detachments. For instance, to increase the productivity of meadows and pastures a detachment is organized which is furnished all the necessary equipment and materials to carry out the program outlined. Harvesting and transport complexes are set up to harvest and lay by feed crops in good condition and in short periods of time. In the wintertime the members of the team are involved in hauling and delivering feeds, carrying manure out to the fields, and so on.

It is up to the team leader, who is relieved of other duties, to organize the work of the feed-gathering team. On matters of organization, technology and mechanization of the production of feed crops he is directly subordinate to the kolkhoz chairman (sovkhoz director), the chief agronomist and the chief engineer.

The high efficiency of this kind of organization of work can be illustrated by taking the Zaprudnovskiy Sovkhoz in Gor'kovskaya Oblast as an example. A team specialized in feed crop production was created there back in 1964. The team was headed by the experienced machine operator M. I. Gogin, now Hero of Socialist Labor and holder of the State Prize. In the very first years after the team was organized, constructive results were achieved: the yield of feed crops was raised, their production cost was reduced, labor productivity in feed crop production increased, and the work discipline of machine operators rose sharply.

In this past 5-year period feed crop production doubled on the sovkhoz. This increase was mainly achieved by improving methods of cultivation and by setting up proper crop rotation. A great deal of work has been done to increase the yield of low-productivity feed crop land. Great importance is being paid to the location of feed crops on irrigated land. To that end the direct labor method was used to build ponds and pumping stations were acquired; a mobilized irrigation detachment was created within the feed-harvesting team. Up-to-date permanent irrigation installations are under construction. There are also plans for future expansion of the irrigated area planted to feed crops.

Organization of the feed-harvesting team on the sovkhoz brought about an appreciable rise of labor productivity in feed crop production. Feed crop production per man-hour is now 4.7-fold higher than it was in 1966. Feed crop production per standard head of livestock is now 2.5-fold higher. Livestock feed reserves sufficient for 1.5 years have been built up on the farm.

Specific recommendations for organizing specialized teams in feed crop production relevant to the conditions of Bryanskaya Oblast were drafted by the Bryansk Zonal Division of the All-Union Scientific Research Institute of Economics, Labor and Management in Agriculture.

In accordance with those recommendations, one or two teams may be organized on every farm (depending on its geographic location, the brokenness of the terrain, the

dispersal of settlements, the state of communications and the road network, and other factors). As the research conducted has shown, under normal production conditions it is best to assign to the feed crop-harvesting team an area between 1,200 and 1,500 hectares (natural feed crop land is included in this area).

When the question of assigning land to the team is settled, the need for equipment and manpower under the production conditions that prevail must be determined at the same time. The principal document for performing these computations are flowcharts drawn up for each feed crop. For the branch of feed crop production as a whole working plans are compiled for the most important production processes (planting, tending crops, and harvesting). They reflect all types of operations, the dates when they are to be performed, the necessary equipment, and the number of operatives. Work schedules of the need for equipment and manpower are compiled at the same time. Ultimately a determination is made of the technical and manpower resources needed (for the farm as a whole) to raise, harvest and lay by feed crops. The number of specialized units and detachments depends on the planned volume and types of feed crops and on local production conditions. For example, on the Pobeda Kolkhoz in Bryanskaya Oblast specialized units (detachments) have been created for the production of silage, root crops, the harvesting of hay and haylage, green fodder and vitaminous meal, and for tending cultivated hayfields and pastures. The harvesting and transport complex for harvesting feed crops is operating effectively within the team.

An important condition for the effective performance of feed crop-harvesting teams is to put all the physical resources for feed crop production at their disposition. Each unit must be given its own part of the assignment with respect to the amount and quality of feed crops to be laid by, ceiling allowances of manpower and materials, deadlines for performing operations, and the conditions for remuneration and material incentives and socialist competition.

Some managers and specialists feel that organization of teams for feed crop production is possible only on those farms adequately supplied with feed crop-harvesting equipment. This opinion is mistaken. After all, the purpose of creating such teams is to carry out more vigorous intrafarm specialization and concentration of feed crop production and to make it a separate and independent branch. Teams for feed crop production can be organized on any kolkhoz and sovkhoz. The requirement is to create a permanent mechanized nucleus for production of feed crops, even though it be small in size at the beginning. Later, concern will have to be paid to its steady reinforcement, to furnishing it equipment for full mechanization.

There is a need to overcome more quickly the psychological barriers to the new forms of organization of work in field crop operations and to allocate equipment and manpower from tractor field-cultivation teams more boldly with the aim of setting them up separately as independent feed crop-harvesting teams. As progressive experience has shown, unless feed crop production is made an independent branch, it is difficult to create a stable source of livestock feed on every kolkhoz and sovkhoz.

The effort to make feed crop production an independent branch must begin with organizing feed crop rotation. On many farms these crop rotations have a large variety

of crops, the fields are distant from livestock-raising projects, a sizable portion of the area planted to the crops is occupied by low-productivity feed crops, and this ultimately detracts from the efficiency of work in feed crop production.

In order to optimize feed crop rotation it is recommended that an economic assessment be made on every farm of the cultivation of feed crops, using such indicators as the yield of feed in fodder-protein units per hectare; expenditures of labor to produce 1 quintal of fodder-protein units; the cost per quintal of fodder-protein units over the last 3-5 years, and so on. As a result a determination is made of the feed crops which are most productive under the conditions of the farms, of the optimum pattern of planting and the type of feed crop rotation. An important measure is to identify the leading feed crops which should be the basis of the sources of livestock feed and to bring the fields as close as possible to livestock-raising operations.

For the kolkhozes and sovkhoses of the Nonchernozem Zone of RSFSR the All-Union Scientific Research Institute of Livestock Feed recommends ley feed crop rotation in which perennial grasses have a share of 50 percent. Feed crops are represented by mangel-wurzel, corn, a vetch-oats mixture, and perennial forage grasses and grassy legumes. The sequence of the crops in one of the patterns of crop rotation is as follows: 1--mixture of field vetch and oats with a catch crop of perennial grasses; 2-4--perennial grasses; 5--winter mixture (rye + vetch + rape) + corn after mowing; 6--mangel-wurzel.

This crop rotation cannot, of course, be taken as a rigid pattern for all farms. On a number of farms it might be possible in view of local production conditions to expand plantings of such intercrops as corn, or to replace certain crops with others. As for the production of grain forage crops, it is inadvisable to include them in feed crop rotation. These crops must remain in the field crop rotation and should determine the unified and principal branch--grain production. Consequently, organizing specialized teams in feed crop production makes it possible to carry out intrafarm specialization and concentration and to set it up as an independent branch. Here, as in no other organizational form, expression is given to the principal technological principle governing production of livestock feed--from the field to the livestock-raising operation.

Specialization and concentration of feed crop production is undergoing further development on the basis of interfarm cooperation. The organizational and economic advantages of this organizational form are especially evident in the weakest link of feed resources--meadow and pasture management. In the central oblasts of the Nonchernozem Zone of RSFSR interfarm enterprises for production of feed on floodlands have become widespread. Particular attention should be paid to summarizing the know-how of the interfarm enterprises Korma in Kaluzhskaya and Poyma in Tul'skaya oblasts.

The principal task of the interfarm enterprise Korma, which was created in 1973 by 12 kolkhozes in Peremyshl'skiy Rayon, is to substantially increase the production of livestock feed by creating irrigated perennial pastures and hayfields on floodlands and to render assistance to the rayon's kolkhozes in harvesting feed crops on unirrigated land. The total area of floodland of the rayon's kolkhozes, which

is located in the valleys of the Oka and Zhizdra rivers, is 7,700 hectares, or 17 percent of all the floodland in the oblast. Thanks to the effort of the Korma enterprise, the kolkhozes of Peremyshl'skiy Rayon have appreciably strengthened their livestock feed resources (Table 1).

Table 1. Livestock Feed Production on the Kolkhozes of Peremyshl'skiy Rayon

| | Annual Average | | 1976-1979/ 1973-1975, % |
|---|------------------|------------------|----------------------------|
| | <u>1973-1975</u> | <u>1976-1979</u> | |
| Feed crops produced on all feed crop area, including grain forage crops, in thousands of quintals of fodder units | 337.1 | 474.2 | 140.6 |
| The same when grain forage crops are excluded, in thousands of quintals of fodder units | 221.4 | 305.8 | 138.1 |
| Feed crops produced, in quintals of fodder units | | | |
| Per hectare of feed crop area | 20.5 | 27.1 | 132.1 |
| Per 100 hectares of farmland | 1,103.2 | 1,553.3 | 140.8 |
| Per standard head of livestock | 23.2 | 29.3 | 126.2 |

These figures indicate that in the 1973-1979 period there was a steady growth trend in the production of feed crops on the rayon's kolkhozes. Moreover, the share of grain forage in the total volume of production has been dropping, and there has been a corresponding increase in the share of succulent and coarse feeds. For instance, whereas in 1972 (before creation of the interfarm enterprise) the share of grain forage in the total volume of feed crops harvested was 47.9 percent, and in the 1976-1979 period it was 35.5 percent. Increasing the volume of production of all types of livestock feed is occurring mainly by virtue of higher productivity of feed crop land.

For the kolkhozes of Peremyshl'skiy Rayon, whose principal branch is the raising of dairy cattle, cultivated pastures are very important. In the period of its operation the enterprise has expanded the area of irrigated cultivated pastures to 3,000 hectares. In order to manage that area of pastures the enterprise was equipped with the necessary high-output equipment, and manufactured fertilizers are applied in the required amount from the air. This has made it possible to increase the yield per hectare on irrigated land to 60 quintals as against 27 quintals of fodder units in 1972 and to introduce enclosed grazing for 6,700 head of cattle.

The role of the interfarm enterprise has been especially large in harvesting feed crops for the participating kolkhozes. Its share in the total volume of feed crops harvested by the latter increased from an average of 18.5 percent for the 1973-1975 period to 57.9 percent in the 1976-1979 period. Production of grass meal and mixed feeds has become an obligation of the interfarm enterprise (Table 2).

At the present time the interfarm enterprise Korma possesses a highly productive material and technical base. It has 45 tractors, 22 trucks and 7 sets of E-280 and E-301 grain-harvesting equipment. A harvesting and transport complex has been organized so that efficient use is made of this equipment in harvesting feed crops.

Table 2. Harvesting of Feed Crops on the Kolkhozes of Peremyshl'skiy Rayon Served by the Interkolkhoz Enterprise Korma, in thousands of quintals

| | Annual Average | | | |
|------------|-------------------|--------------------------|-------------------|--------------------------|
| | 1973-1975 | | 1976-1979 | |
| | By Kol- khozes | By Enter- prise Alone | By Kol- khozes | By Enter- prise Alone |
| Hay | 73.6 | 5.6 | 58.5 | 4.0 |
| Silage | 237.8 | 112.5 | 307.3 | 162.3 |
| Haylage | 154.7 | -- | 124.7 | 81.5 |
| Grass meal | 5.0 | 3.9 | 12.8 | 12.0 |
| Mixed feed | 0.8 | 0.8 | 22.4 | 22.4 |

The collective of the harvesting and transport complex operates according to a specific schedule under which the harvesting of feed crops begins on the remote kolkhozes and those with less equipment. This helps to even out the periods for feed crop harvesting, reduces crop losses and improves the quality of feeds. The time which the harvesting complex spends on each kolkhoz is strictly limited and must not exceed a period of 10 days. This makes it incumbent upon the management of every farm to create the necessary conditions for harvesting the feed crop within that period. The volume of feed crops harvested and their cost for each farm are determined on the basis of contracts concluded with them. These contracts spell out mutual obligations. For instance, the interfarm enterprise is required to harvest feed crops competently and at the optimum time with the smallest expenditures of manpower and resources, and the kolkhozes are required to help the enterprise in meeting its obligations. The enterprise presents the kolkhoz its bill for payment on the basis of the official document certifying acceptance of the harvested and stored feed crops.

The enterprise performs a number of other important types of operations for the rayon's kolkhozes. For instance, in 1979 the enterprise applied to fields 33 percent of the rayon's volume of manure, applied top dressing to crops from the air and provided the irrigation on irrigated land, and over the entire area of the rayon it performed a substantial amount of freight hauling. Recently the enterprise has been rendering the kolkhozes services in performing such field operations as fall plowing, preparing the soil before planting, crop planting, and so on.

The comprehensive solution of the problem of increasing the production and improving the quality of feed crops has made it possible for the kolkhozes of the rayon to increase their production of the products of animal husbandry. For instance, on the kolkhozes of Peremyshl'skiy Rayon in 1978 the level of production of livestock feed per 100 hectares of farmland was more than 1.8-fold higher than the same level on the kolkhozes of the oblast. This has made it possible to substantially increase the density of the livestock herd. Production of the products of animal husbandry per 100 hectares of farmland on the kolkhozes of the rayon exceeded by more than 1.6-fold the level attained by the oblast's kolkhozes.

Substantial shifts have also occurred in strengthening livestock feed resources and increasing production of the products of animal husbandry on the kolkhozes of Suverovskiy Rayon in Tul'skaya Oblast. Its livestock feed production has increased 34 percent over 1973, which made possible a 30.8-percent increase in milk production. Moreover, the quality of feed harvested has increased, and the cost has dropped. In large part this success is the result of the activity of the interfarm enterprise Poyma.

The enterprise has a strong harvesting and transport complex, which makes it possible to reduce feed crop-harvesting time substantially and improve the quality of feed crops thanks to more intensive cultivation of floodlands on the kolkhozes. For instance, on the average during the period 1976-1979 the enterprise harvested 32 percent of the coarse and succulent feeds harvested in the rayon. This has at the same time helped to reduce the need for grain in feeding livestock. While solving the principal problem of increasing the production of feed crops in the rayon, the interfarm enterprise has been rendering a number of important services to the kolkhozes: it applies manures and manufactured fertilizers to fields, it does fall plowing and other types of preparation of the soil, and it does hauling.

The progressive practice in field crop production through interfarm entities deserves approval and dissemination to other regions of the country. At the same time there are also problems in this effort which need to be solved very quickly. The floodland areas of the kolkhozes which are served by the enterprises Korma and Poyma have remained under the control of the farms. As a result every kolkhoz uses this as it sees fit. This kind of organization of the production of feed crops makes it difficult to carry out the set of measures to increase the efficiency of feed crop land on a centralized basis. The geographic dispersal of these plots of land and their small individual size hampers the scale of activity of the enterprises. Consequently, the land, the technical resources and the manpower are not being used efficiently enough as yet in the interfarm entities. In order to increase the production efficiency of livestock feed on an interfarm basis it would be advisable to transfer to the enterprises feed crop land and accord them full independence in its use. The kolkhozes should be left the right of monitoring the use of the land, which would be accomplished by means of contracts.

The future of the interfarm enterprises Korma and Poyma lies in further augmentation of the production of coarse and succulent feeds by expanding the irrigation network, by strengthening the material and technical base, by introducing progressive technologies and full mechanization of production and feed crop harvesting, and by putting feed crop production on an industrial basis. In the next few years plans call for interfarm enterprises to harvest all the coarse and succulent feeds in the rayons.

Under the conditions of Bryanskaya Oblast interfarm enterprises like these for the production of livestock feed have been organized in eight rayons. This has yielded favorable results in solving the problem of increasing the production of livestock feed. But quite a bit more will have to be done to solve the problem altogether. We should note that the oblast possesses large tracts of natural feed crop land. For instance, on the oblast's kolkhozes alone there are 125,000 hectares of natural hayfields and 140,000 hectares of pastures, which represents 60 percent of the

entire area devoted to feed crops. But because of low productivity their share does not exceed 30 percent in livestock feed resources. Calculations show that performing a set of measures to intensify production on the entire area of natural meadows and pastures would make it possible for the kolkhozes to maintain twice the number of livestock they now have.

Within this group of kolkhozes the organization of feed crop production on farms which have large livestock-raising complexes and also on farms specializing in feed crop production commands a certain interest. Plants or stations for production of ground and pelletized feeds are being built on those farms in order to solve the problem of uniform employment of the workers and for more efficient use of equipment. The manpower of these farms is being used to organize the transport of feed to livestock-raising complexes and to perform other operations. Relations between farms specialized in the production of feed with interfarm livestock-raising enterprises are regulated by contract and are governed by the relevant accounting prices. The accounting prices ensure reimbursement of costs of producing the feed and provide a certain rate of accumulation.

It is thus a complicated and multifarious task to make feed crop production into a separate branch. This task is being performed by using various forms of organization of production and work.

Problems in the Development of the Mixed Feed Industry--A. Pavlyuchenkov and V. Goncharov

Intensification of the production of the products of animal husbandry and placement of animal husbandry on an industrial basis require increased production of full-valued mixed feeds. Mixed feeds, balanced in their principal nutrients and enriched with vitamins, trace elements and other biologically active substances, ensure productivity of animals and at the same time reduce the consumption of feed per unit of the product. The quality of the product of animal husbandry is improved, and its cost is reduced.

The country's production of mixed feeds increased from 15.5 million tons in 1970 to 60.3 million tons in 1979, that is, nearly fourfold. They are being produced in the system of the USSR Ministry of Procurements, the USSR Ministry of Agriculture and other departments. The bulk is manufactured at enterprises of the Ministry of Procurements--81.4 percent of national output according to 1979 figures.

Two lines of development are clearly outlined at the present time in the country's mixed feed industry: production of mixed feeds at state enterprises; the manufacture of protein-vitamin additives at state plants and production of mixed feeds using them at kolkhoz, sovkhos and interfarm enterprises.

The latter direction has experienced the most substantial development in recent years. Interfarm mixed feed plants and shops are beginning to play an ever larger role in the production of full-valued feeds for socialized livestock raising, especially in those areas of the country where intensive specialization and concentration of agriculture is taking place. The share of the production of mixed feeds

at interfarm enterprises has increased from 10.1 percent of the national volume in 1975 to 15 percent in 1979.

The production of mixed feeds in the system of agriculture using protein-vitamin additives has promoted more efficient use of grain intended for forage purposes and reduction of shipping costs to deliver the raw materials and the finished product.

The growth in the production of mixed feeds has been accompanied by a further expansion of their assortment, and here we should note that the assortment has not merely expanded, but has also improved. More products are now being manufactured that have high nutritional value.

During the 10th Five-Year Plan the share of mixed feed production for poultry at state mixed feed enterprises increased from 30.9 percent in 1975 to 36.0 percent in 1979, and the share of mixed feeds produced for cattle dropped over the same period from 18.9 to 18.3 percent. In the system of the USSR Ministry of Agriculture, on the other hand, more mixed feeds are being manufactured for cattle and hogs. For instance, in 1979 the share of mixed feeds for cattle represented 50.4 percent of the total, feed for hogs 30.9 percent and feed for poultry 7.1 percent.

As technical progress has developed, the process of mixed feed production has become more complicated. Crushing and roller mills are used to grind up the raw materials. To be specific, AI-DZHL oilcake breakers are used for oilcake slab, fish meal pellets and other components arriving in pressed form at mixed feed plants. In recent years the AI-DDP and AI-DDR crushing mills have been put into production to grind up grain and oilseed meal.

Interfarm mixed feed plants are mainly being built and equipped with the Soviet-manufactured OKTs-15, OKTs-30 and OKTs-50 which ensure an uninterrupted flow in the processing of mixed feeds. MUK2-35 units are still being used in certain oblasts.

Along with the rather large increase in the production of mixed feeds in the country, their share in the total consumption of concentrated feeds is negligible. In 1978 the USSR average was 43.3 percent. The highest percentage of consumption of mixed feeds is in the republics of the Transcaucasus (79.8 percent in Armenian SSR, 87.7 percent in Georgian SSR, 66.8 percent in Azerbaijan SSR), Tadzhik SSR (63.3 percent), Latvian SSR (62.8 percent), Uzbek SSR (61.5 percent), Belorussian SSR (63.4 percent), while it is low in RSFSR (38.9 percent), Kirgiz SSR (38.7 percent), Kazakh SSR (30.8 percent) and Turkmen SSR (40.6 percent). This kind of difference in mixed feed consumption in the country is explained by the geographic pattern that has come about in the specialization of animal husbandry.

The principal components in mixed feed production are grains--barley, oats, wheat, millet, corn and rye. Leguminous crops--peas, soybeans, vetch, lupine, and others--have great importance in the balance of raw materials for the mixed feed industry. They are rich in protein, which is indispensable to animals and poultry.

In connection with the organization of interkolkhoz mixed feed plants there began to be a change in the planting pattern on kolkhozes; opportunities were sought for expanding crops of forage grain, especially peas, and other high-protein crops. Different rates of return in the form of mixed feeds, depending on the type and quality of the raw materials supplied, were established in order to enhance motivation to expand production and deliver for processing high-quality protein feed crops and feed additives.

The share of grain in the total volume of raw materials for the mixed feed industry was 64 percent for the country as a whole in 1975 and 65.7 percent in 1978. At the same time there has been a substantial improvement in the pattern of grain used. For instance, whereas in 1971 wheat accounted for 35 percent of the volume of the raw materials, its share in 1978 was 23.3 percent. At the same time the share of leguminous crops has dropped from 1.8 to 0.6 percent. The share of oats (2.3 percent) in the distribution of the raw materials is too low.

We should note that sizable amounts of grain are fed to livestock in pure form. For example, in the Ukraine about 6 million tons of grain are annually consumed for forage purposes without enrichment or processing into mixed feeds. These figures confirm the importance of the problem of attracting the grain of kolkhozes and sovkhoses into the production of mixed feeds in order to increase the efficiency of its use.

At the present time three ways of attracting the forage grain of farms into the production of mixed feeds have taken shape in the country and should be further developed:

1. Exchange of forage grain for finished mixed feed. From the economic standpoint this is the most acceptable to farms located at distances of no more than 20-25 km from mixed feed enterprises. And whereas exchange of grain for mixed feed is now done on a small scale as yet, there are plans for increasing it substantially in future.
2. Above-plan sale of grain and procurement of finished mixed feed. Like the exchange of grain, its sale to the state does not eliminate shipment of loads over long distances. It must be said that this form of attracting forage grain is not widespread because of the limited distribution of mixed feeds.
3. Production of full-valued mixed feeds at interfarm and kolkhoz-sovkhoz mixed feed plants using their own grain and protein-vitamin additives manufactured at state mixed feed plants. As an analysis has shown, this kind of production of mixed feeds is effective on kolkhozes and sovkhoses located at distances of 25 km or more from state mixed feed plants.

In each individual case a determination can be made as a function of the specific conditions as to which of these forms will be the most effective. For instance, selling grain and purchasing mixed feeds is more advantageous for farms located in zones with high grain prices, and the exchange of grain, conversely, is more advantageous for farms located in zones with low grain prices, that is, in the areas where grain is produced. For example, the Ukraine has seen the most intensive

development of mixed feed production at interfarm and kolkhoz-sovkhoz mixed feed plants using industrially manufactured protein and vitamin additives.

Though grain feeds have been and will remain the principal source of feed protein, it must be taken into account that their protein is poor in essential amino acids, and in the period when the animals are kept in the barn, the feeds are poor in vitamins. It is accordingly necessary that the rations of the animals include feeds of animal origin (skimmed milk, fish meal and meat-bone meal), soya and sunflower oil cake and seed cake, industrially produced feed supplements (fodder yeasts, amino acids, vitamins and others). Dried bagasse is a good component of mixed feeds.

The manufacture of dried bagasse in the form of cakes and pellets enriched with molasses is becoming especially important with the development of interfarm mixed feed plants in recent years; they use it as one of the principal components of mixed feeds.

In 1979 kolkhozes received 35.1 million tons of bagasse and sovkhozes 9.7 million tons. Only 11.6 percent of beet bagasse went for industrial processing.

The potential for increasing the production of dried bagasse is sizable. At sugar mills there are 135 bagasse drying shops, and their capacity is not fully utilized. If the problem of increasing the production of dried bagasse is to be solved effectively, a procedure for its distribution needs to be prescribed. Sugar mills and agricultural enterprises are not motivated to produce dried bagasse, which as a rule is shipped for production of mixed feeds. It is more advantageous for them to have fresh and sour bagasse to feed their own livestock. In order to motivate the sugar mills to produce dried bagasse, it would be wise to deliver them mixed feeds in exchange for the bagasse. The prices of beet bagasse need to be adjusted, since they do not fully take into account its value as a livestock feed. For instance, wholesale prices of dried bagasse exceed 5-7-fold the price of fresh bagasse and are less than half the price of oats. Yet oats contains only 30 percent more fodder units than dried bagasse.

More effective use of the waste of the fats and oil industry has great importance to strengthening raw material resources of the mixed feed industry. In 1979 it produced 1,194,700 tons of sunflower, 1,435,000 tons of cotton and 1,152,000 tons of soya seed cake, as well as 182,800 tons of sunflower and 173,700 tons of cotton oil cake.

Oil cake and seed cake go to the mixed feed industry. A portion is used directly at kolkhozes and sovkhozes as protein additives to rations consisting of coarse and succulent feeds.

Approximately 14 percent of the hulls are left in the processing of sunflower seeds. Some is used as fuel. But the hulls are a valuable raw material for obtaining fodder yeasts. From 1 ton of dried hulls 44 kg of absolutely dry fodder yeasts are produced. Use of hulls as fuel therefore needs to be stopped in order to strengthen the feed resources of animal husbandry, and they should go into the manufacture of fodder yeasts.

In recent years shops have been built to grind up seed cake at certain fats and oil enterprises, especially at enterprises processing cotton seed in view of the needs of the mixed feed industry of the USSR Ministry of Procurements. In 1979 these enterprises manufactured 159,000 tons of ground cotton seed cake, which is 11 percent of all the cotton seed cake produced.

The mixed feed industry needs waste from the meat and fish industries. Dry live-stock feed contains full-valued proteins necessary for intensive development and fattening of animals.

The production of dry animal feed per ton of meat and Category 1 edible offals increased 34.1 percent between 1970 and 1979, and the potential exists for increasing their production at a number of enterprises in the meat industry where shops could be set up for production of feed.

To make up for the shortage of protein-rich feed, more extensive use must be made of the products of chemical synthesis, of which carbamide is becoming more and more widespread. When properly used in mixed feeds and assuming the feeding technology is worked out, carbamide can replace as much as 30 percent of the protein in the rations of ruminants.

Experience has shown that carbamide is used most effectively in the form of a concentrate. But mixed feeds containing carbamide concentrate tend to cake when stored. Bentonite clays tend to reduce the cakiness of carbamide. In our opinion, it would be wise to centralize the production of noncaking carbamides containing bentonite at plants of the chemical industry so that optimum use can be made of the raw material.

Full-valued mixed feeds should be balanced with respect to all the necessary components, which depends on the availability of the protein raw materials, especially that of animal origin, trace elements, vitamins and other biologically active substances.

Because of the shortage of protein types of raw materials, the state mixed feed industry is by no means satisfying the needs of interfarm mixed feed plants for full-valued protein and vitamin additives. That is why measures are being taken in the country to develop sources of raw materials for manufacturing mixed feeds within the system of agriculture.

Enterprises for the production of hydrolysis yeasts, meat and bone flour, amide-mineral bagasse, vitaminous-grass meal, dried skim milk and other high-value live-stock feed additives are being built on the basis of interfarm cooperation. For instance, in 1979 1,935 tons of dried skim milk and 57,468 tons of dry meat and bone feeds were produced within the system of agriculture.

We should nevertheless note that many interfarm mixed feed plants are not able to use their own production capacities. Augmentation of the production of mixed feeds is being held back because forage grain is not being delivered on time, the plants are not fully supplied with raw materials and other components, capacity for storage of grain and other raw materials is lacking, there is a shortage of trucks, and the enterprises are not fully staffed with qualified specialists.

In the period after the March (1965) Plenum of the CPSU Central Committee substantial shifts took place in the country in the location of the mixed feed industry (see the table). The share of the Ukrainian SSR, Belorussian SSR and Moldavian SSR in the total volume of mixed feeds produced increased from 22.5 percent in 1965 to 31.5 percent in 1979, whereas over that same period the share of RSFSR, Estonian SSR and Kazakh SSR dropped from 63.8 percent to 55.2 percent.

Location of Mixed Feed Production

| | In Thousands of Tons | | | |
|-----------------|----------------------|----------|----------|----------|
| | 1965 | 1970 | 1975 | 1979 |
| USSR | 15,515.6 | 23,749.5 | 41,827.8 | 60,316.3 |
| RSFSR | 8,754.8 | 12,611.5 | 20,069.8 | 30,234.6 |
| Ukrainian SSR | 2,550.6 | 3,949.1 | 10,054.5 | 14,444.9 |
| Lithuanian SSR | 531.2 | 914.6 | 1,403.6 | 1,860.2 |
| Latvian SSR | 340.3 | 626.0 | 982.5 | 1,362.0 |
| Estonian SSR | 278.0 | 422.7 | 563.2 | 721.8 |
| Georgian SSR | 245.0 | 402.7 | 683.8 | 884.1 |
| Azerbaijan SSR | 197.1 | 317.5 | 458.0 | 634.3 |
| Armenian SSR | 164.8 | 245.0 | 323.4 | 554.8 |
| Uzbek SSR | 386.0 | 523.1 | 941.2 | 1,506.2 |
| Kirghiz SSR | 88.3 | 180.0 | 403.5 | 572.5 |
| Tadzhik SSR | 72.1 | 185.3 | 236.0 | 343.5 |
| Turkmen SSR | 94.2 | 90.8 | 163.7 | 216.7 |
| Kazakh SSR | 876.7 | 1,210.1 | 1,768.9 | 2,342.9 |
| Belorussian SSR | 710.5 | 1,637.1 | 2,685.8 | 3,162.9 |
| Moldavian SSR | 226.0 | 434.2 | 1,089.9 | 1,474.9 |

| | In Percentage | | | | 1979/1965, % |
|-----------------|---------------|-------|-------|-------|--------------|
| | 1965 | 1970 | 1975 | 1979 | |
| USSR | 100.0 | 100.0 | 100.0 | 100.0 | 389 |
| RSFSR | 56.4 | 53.2 | 48.0 | 50.1 | 345 |
| Ukrainian SSR | 16.4 | 16.6 | 24.0 | 23.9 | 566 |
| Lithuanian SSR | 3.4 | 3.9 | 3.4 | 3.1 | 350 |
| Latvian SSR | 2.1 | 2.6 | 2.3 | 2.3 | 400 |
| Estonian SSR | 1.8 | 1.8 | 1.3 | 1.2 | 260 |
| Georgian SSR | 1.6 | 1.7 | 1.6 | 1.5 | 361 |
| Azerbaijan SSR | 1.3 | 1.3 | 1.1 | 1.1 | 322 |
| Armenian SSR | 1.1 | 1.0 | 0.8 | 0.9 | 337 |
| Uzbek SSR | 2.5 | 2.1 | 2.3 | 2.5 | 390 |
| Kirguiz SSR | 0.6 | 0.8 | 1.0 | 0.9 | 648 |
| Tadzhik SSR | 0.5 | 0.8 | 0.6 | 0.6 | 476 |
| Turkmen SSR | 0.6 | 0.4 | 0.4 | 0.4 | 230 |
| Kazakh SSR | 5.6 | 5.1 | 4.2 | 3.9 | 267 |
| Belorussian SSR | 4.6 | 6.9 | 6.4 | 5.2 | 445 |
| Moldavian SSR | 1.5 | 1.8 | 2.6 | 2.4 | 653 |

The density of mixed feed production, that is, output per square kilometer of area, has risen substantially as the mixed feed industry has developed. In the 1971-1979 period it increased 2.5-fold in the country as a whole.

In 1979 the highest density of mixed feed production was in Moldavian SSR (43.8 tons per square kilometer), Lithuanian SSR (28.5), Ukrainian SSR (23.9), Latvian SSR (21.4), Armenian SSR (18.7), Belorussian SSR (15.2), Estonian SSR (16) and Central Chernozem Region of RSFSR (16.6), and it was low in Kazakh SSR (0.9), Uzbek SSR (3.4), Kirghiz SSR (2.9) and Turkmen SSR (0.4 ton per square kilometer).

Mixed feeds are being manufactured, as noted previously, by different departments. As a consequence there are great fluctuations in their production from region to region of the country at enterprises of the USSR Ministry of Procurements and in interkolkhoz organizations.

The production of mixed feeds in Armenian SSR, Tadzhik SSR, Turkmen SSR and Kazakh SSR is confined to enterprises of the USSR Ministry of Procurements, while in Ukrainian SSR and Moldavian SSR the bulk of mixed feeds are produced at interfarm enterprises. For instance, their share in total mixed feed production increased from 36.1 percent in 1975 to 47.5 percent in 1979 in Ukrainian SSR and from 33.4 percent to 36 percent in Moldavian SSR over the same period.

In locating interfarm mixed feed enterprises consideration must be given to the location of state mixed feed plants. In rayons where grain forage crops are intensively cultivated it is advisable to develop both the state mixed feed industry and also production of mixed feeds using local raw materials at interfarm mixed feed enterprises.

However, as a rule location of state plants is not taken into account when interfarm mixed feed enterprises are built. There is no unified plan for the development and location of the mixed feed industry within the system of the USSR Ministry of Procurements or the USSR Ministry of Agriculture. Alongside the large state plants enterprises with a small capacity are often built in the system of agriculture. Often interfarm mixed feed plants are located in rayon centers which are far from the participating farms.

The increase in the output of mixed feeds within agriculture, using its own grain, has necessitated an increase in the production of protein-vitamin additives. Their output in 1979 was 17-fold greater than in 1970.

The production of protein-vitamin additives has developed primarily in the republics and economic regions raising grain: Ukrainian SSR, the Northern Caucasus and Volga economic regions of RSFSR, Kazakh SSR and Moldavian SSR. It has developed most intensively in Ukrainian SSR and RSFSR, whose share is now 80 percent of national output.

In the 11th Five-Year Plan much attention should be paid to improving the mixed feed industry's supply of raw materials, optimum use of those raw materials, and introduction of new forms. This is related not only to the growth of production of mixed feeds, but also to the need to expand their assortment. In order to make

up for the shortage of protein feeds every potential must be used to obtain them, including the products of chemical synthesis. Waste of the food manufacturing industry should serve as an important reserve for increasing protein-rich raw materials.

Particular attention should be paid to improving the present formulas of premixes. The volume of production of premixes is increasing. For instance, their output rose 70 percent between 1975 and 1978. At the same time the need to standardize their recipes has arisen in connection with the increased use of premixes for different animals and poultry. Use of standardized premixes will make it possible to achieve not only their production at a uniform pace, but also their uninterrupted supply to mixed feed enterprises and their efficient use in the production of mixed feeds, with smaller losses of biologically active substances.

In future it would be wise to pay a great deal of attention to building warehouses for raw materials and also silo structures. In this connection the problem of storing and preserving grass meal is particularly acute. One of the urgent problems is to ensure the preservation of carotene in grass meal that is stored.

The present system of prices for delivered grain is in need of improvement in order to enhance the motivation of kolkhozes and sovkhozes to increase production and sale of grain for the manufacture of mixed feeds.

We should also speak about the need for further technical improvement of mixed feed enterprises, for raising the level of mechanization of laborious processes, and for introduction of lines for the input of molasses, fat and carbamide concentrate.

Inadequate storage capacity for raw materials at mixed feed enterprises prevents them from building up a sufficient stock for a uniform pace of operation of the enterprises during the main grain-harvesting season. Their normal operation requires a storage capacity of 12,000-18,000 tons for grain and nongrain raw materials within the limits of 70-80 percent of their annual need. In many cases interfarm enterprises now lack such capacity.

Interfarm mixed feed plants need their own drying operation and specialized trucks for centralized delivery of mixed feeds directly to livestock-raising operations.

A further strengthening of direct relations between mixed feed enterprises and farms and specialized livestock-raising complexes is important to obtaining raw materials in good time and to improving the supply of mixed feeds to the farms. In future the structure of mixed feeds manufactured at enterprises of the USSR Ministry of Procurements should undergo substantial change in order to meet the needs of livestock raising for particular types of mixed feeds. It would be advisable for these enterprises to increase the production of mixed feeds for poultry, young cattle, various species of fish and other animals.

Along with the development and strengthening of the material and technical base of state mixed feed plants, there is a need for broader development of construction of mixed feed enterprises in the system of the USSR Ministry of Agriculture. Further development of the production of mixed feeds within the system of agriculture

on the basis of cooperation between the suppliers of raw materials and the consumers of the products necessitates closer linkage with the location of state mixed feed enterprises and livestock-raising complexes and projects.

In order to improve the planning of the development and location of the mixed feed industry it would be advisable to unify research in this field being conducted in the country and also to work out an overall program for production and processing of grain, which will make it possible to improve the operational efficiency of the country's food complex.

Fuller Utilization of the Potential for Feed Crop Production--V. Drachuk and L. Kozhenkova

In the present period livestock feed contains mainly digestible protein of plant origin. But this is insufficient for making up a full-valued ration. Scientifically sound norms call for between 104 and 110 grams of digestible protein per fodder unit. In actuality only 95 grams of protein is being supplied, and in the Non-chernozem Zone of RSFSR it is even less--60-70 grams. Thus we can assume that in the present period the needs of animal husbandry for digestible protein are being met at a level of only 86 percent.

Yet it is possible to substantially increase the protein content of feed by enriching with proteins of animal origin. This refers above all to fish meal and meat-bone meal, which should comprise at least 1 percent of the ration, and fodder yeasts in the amount of 0.8-0.4 percent of the total balance of feed protein. Achieving the full amount of these protein elements in livestock feed is going too slowly and is not going far enough.

As our computations have shown, over the next 5-10 years we can realistically set the task of providing protein-rich feed for the following: for cattle 2 percent of the total amount of feed, for hogs 7 percent and for poultry 6.3 percent. This indicator would be 4.5-4 percent for animal husbandry as a whole.

How can we ensure the attainment of these figures?

First of all we must make fuller use of the waste of the meat processing industry and organize the production of protein feed of animal origin right at all of its enterprises. In 1970 the total capacity of the enterprises of the meat industry for manufacturing dry livestock feed increased more than 1.5-fold and reached 1,122 tons per shift, and in 1978 their production was 2.8-fold greater. But the need of the mixed feed industry is still not being met, and this is holding back the growth of production of full-valued mixed feeds.

In 1978 enterprises of the meat industry produced only 8.5 kg of dry livestock feed per ton of mixed feeds, which is obviously inadequate. One of the important objective indicators characterizing the level of utilization of raw materials in the manufacture of dry livestock feed is their production per ton of meat. Whereas in 1965 the national average was 35.1 kg of dry protein-rich feed per ton of meat, the figure in 1978 was already 57 kg. At certain associations and enterprises this figure is far higher. For example, at the Tula Association of the Meat Processing

Industry, where extensive use is made of combined continuous units for processing bones, the yield of dry feed per ton of meat in 1978 was 67 kg. At the Moscow Meat Combine, where production of dry feed has been organized in a continuous unit according to a recipe that calls for a high content of bone meal in the product produced, this indicator was 86 kg.

But many enterprises of the meat industry are not using the opportunities that exist for increasing the production of dry feed. The principal types of secondary raw materials, which include konfiskaty, bone, products containing carotene, and blood are being insufficiently utilized. According to official figures, in 1978 the standard for blood recovery was fulfilled at a level of 98.5 percent. But even this comparatively good figure does not reflect the real state of affairs. The present standards governing blood recovery in the slaughtering of cattle are too low and do not promote full utilization of this valuable raw material.

Nor are bones being fully utilized for the production of meat-bone meal. A large amount of them are lost because they are not processed in good time. In 1978 the shortfall of bone meal for livestock feed was 44,000 tons because of incomplete, tardy and insufficient utilization of bones.

Horns, hooves, bristles, flaps and hair, waste containing carotene, are an important source of protein that can be obtained in the slaughtering of livestock and poultry. In the meat industry the yield of carotene-containing raw materials is 50,000 tons annually, but only a negligible portion is utilized (6,000-8,000 tons on the average, or 14 percent).

Altogether enterprises of the meat industry, in assuming they used all existing resources and applied progressive technology, had the capacity in 1978 to produce at least 20 percent more dry livestock feed than they actually did.

On the basis of recommendations of the Moscow Meat Combine the All-Union Scientific Research Institute of the Meat Industry has drafted recommendations for the production of dry flour from the rumens of cattle, which could be organized at any enterprise that has horizontal-vacuum boilers or heating apparatus designed by the institute Gipromyaso. It is recommended that the rumens be used in production of offals in the milling industry, adding it as a component to the meat-bone raw material. This enriches the easily assimilable protein substances in the offals. The raw rumen, at a moisture of 87.7 percent, contains as much as 1.6 percent protein, which ensures additional use of sources of protein.

Until recently mostly skulls were used in preparing meat-bone flour; skulls comprise only 5.1 percent of the waste. The total amount of bone in the cattle carcass, for example, varies from 21 to 32 percent depending on the animal's nourishment, in the carcass of a sheep or goat it is 8-17 percent, and in a hog 5-9 percent. Assuming complete recovery of the bones, on the average as much as 18 percent of the weight of the carcass, or 11.7 percent of the live weight of livestock to be processed, could be obtained for processing.

If we take into account all other forms of slaughterhouse waste, by 1985, according to our calculations, raw materials resources for production of dry feed of animal

origin could amount to 10.4 million tons. From this raw material it would be possible to obtain 2.6 million tons of offals, or nearly fourfold more than in 1970.

The average content of digestible protein in feed when this additive in production of offals is taken into account would be at least 115 grams per fodder unit. A further increase in protein content could be achieved through improved use of inedible fish species for livestock feed along with a simultaneous increase in the size of the catch, through better utilization of the waste of meat processing enterprises and by increasing the production of plant protein, hydrolysis yeasts, and so on.

Supplying livestock and poultry raising full-valued feed balanced with respect to digestible protein will make it possible on this basis alone to produce 430,000 tons of meat and 2.7 billion eggs, and kolkhozes, sovkhozes and industrial-type poultry farms would obtain additional income in the amount of 2.5 billion rubles.

What needs to be done in specific terms for these calculations on increasing the production of offals and meat to become reality?

First of all there is a need to develop the meat processing industry so that all the livestock fattened is processed at up-to-date enterprises or specialized slaughtering stations. In addition, these enterprises should have the necessary production capacities (shop) for full utilization of the waste from slaughtering for offals.

Given the substantial concentration of the meat processing industry which has been achieved in the present period (larger capacities of meat combines and their fairly dispersed location over the territory of the country), a portion of the live weight is lost during delivery of the livestock to meat combines and during its preparation for slaughter. In certain cases these losses amount to 4-5 percent of live weight. It is therefore advisable to develop the network of slaughtering stations on large sovkhozes and kolkhozes oriented toward livestock production when they are located in areas far from meat combines. Livestock slaughtering stations on sovkhozes and kolkhozes could have a production capacity of 25 head of cattle per shift, with a refrigerator and sausage shop, or for 10 head per shift without those facilities. They could also slaughter livestock raised on private farms of kolkhoz members, workers and employees in rural localities. These stations could have production lines for processing the waste of slaughtering into offals or could preserve them and periodically ship them to the nearest meat combine. All meat processing enterprises in operation and those newly built should include a shop for production of meat-bone flour. In this connection it is indispensable for existing shops to undergo reconstruction and for new equipment and advanced technology to be introduced. All of this will make it possible to bring the total capacity of shops for production of dry feed at meat processing enterprises up to 6,330 tons per shift. This is exactly the capacity needed to cover production of the amount of feed calculated above on the basis of full utilization of all waste in the meat processing industry.

Performance of these measures necessitates certain capital investments. According to our calculations 1,716 million rubles would have to be spent for additional

construction of shops for production of dry feed, 140 million rubles to modernize existing shops, and 381 million rubles to build slaughtering stations.

Assuming that specific local conditions for construction are taken into account, that the capacities of the facilities to be built or to undergo reconstruction are determined as a function of the class of equipment to be delivered to those facilities, the total amount of capital investments required could increase somewhat. Nevertheless, on the whole, this measure is economically advantageous for the national economy. On the average the money invested would be paid back in about 1 year.

Ways of Increasing the Efficiency of Feed Crop Production--M. Ionov

The process of putting livestock raising on an industrial basis, which is developing intensively, raises the problem of doing everything to develop the production of mixed feeds. Mixed feeds balanced with respect to the principal nutrients and enriched with vitamins, antibiotics, trace elements and other substances, are 25-30 percent more effective than ordinary concentrates.

In Chuvashskaya ASSR organization of interfarm enterprises to produce mixed feeds began immediately after the decree of the CPSU Central Committee was adopted in May 1976 on the question of specialization and concentration of agricultural production through interfarm cooperation and agroindustrial integration. By 1977 a republic production interfarm association for the production of feed, Chuvashkombikorm, had already been set up. It began to supervise cost-accounting interfarm enterprises for the production of feed, to render them constant aid in resolving production and organizational and technical problems, and also gradually to put the mixed feed shops of kolkhozes and sovkhozes on an interfarm basis. The task was set of seeing that all the grain forage going for feed in socialized livestock production was processed into mixed feeds.

In the years that have passed the association Chuvashkombikorm has made a definite effort. The association now includes 14 interfarm enterprises with a designed capacity of 290 tons of mixed feeds per shift. Thanks to construction and expansion of production facilities and also conversion of mixed feed shops of kolkhozes and sovkhozes to an interfarm basis, fixed capital has increased from 2.3 to 6.5 million rubles.

Conversion of the mixed feed shops of kolkhozes and sovkhozes to an interfarm basis has unquestionably made it possible to use the available equipment more productively. They are now producing 5,000-8,000 tons of mixed feeds per year, whereas before transition to the interfarm basis they were practically inoperative for technical and organizational reasons.

As a result of performing organizational and technical measures, of improving mutual relations with the participating farms, and also of reconstruction of existing production lines of mixed feed shops, production of mixed feeds in the republic is growing year after year. Whereas in 1976 interfarm enterprises produced 9,000 tons of mixed feeds, in 1979 they produced more than 69,000 tons. In the period of the association's existence the number of farms using the services and products of interfarm enterprises has increased from 68 to 125.

Along with increased production of mixed feeds, the quality of the product produced has been at the center of attention. Laboratories with the necessary equipment exist at all interfarm enterprises. The laboratories check the quality of the product by conducting the appropriate analyses, and they regularly record their results in a special journal. A quality certificate which is delivered to the consumer is written out for each batch of mixed feeds.

Every year interfarm enterprises conclude contracts with participating farms for delivery of grain forage for production of mixed feeds and feed supplements. Under the terms of the contract both sides assume obligations to fulfill these conditions, and should one of the parties fail to perform, he must pay a penalty not to exceed 2 percent. Moreover, the farm pays a penalty based on the value of raw materials not delivered, and the interfarm enterprise pays it on the value of products not delivered.

It seems at first that the entire system of relations and responsibility of the parties have been worked out. In practice matters are not nearly so good. In 1978 participating farms committed themselves to deliver 62,700 tons of grain forage to interfarm enterprises, but they delivered only 25,700 tons, or 41.1 percent. For example, at the Vurnarskoye interfarm enterprise 6 farms committed themselves in 1978 to deliver 3,425 tons of grain forage for processing, but only 881.1 tons, or 25.7 percent, actually arrived. And it is only thanks to the delivery of grain forage from other farms that the enterprise was able to fulfill its production program.

At this point the question arises: why are the penalties not invoked against the undisciplined farms, since they were stipulated in the contract? Certain interfarm enterprises tried to use this form of pressure, but the directors of the participating farms later ceased altogether to deliver grain forage for processing. When the interfarm enterprises put this question in the council of the association the decision was made to renounce the coercive forms of pressure.

In 1978 a decree was adopted by the republic's council of ministers on improved use of capacities of interfarm enterprises of the association. This decree defined the production program for the 10th Five-Year Plan. In carrying out the decree 7 interfarm enterprises built storage capacities of 3,500 tons each along with grain-drying stations. As a result by the end of 1979 the total storage capacity was brought up to 45,000 tons of grain forage. This makes it possible in the harvest season to pour grain into the storage facilities amounting to 60-70 percent of the annual grain requirement for operation of the enterprises.

But along with the growth of capacities of interfarm enterprises and the increase in the types of production and services, their use is still incomplete because of the poor supply of grain forage and the green matter of grass for AVM [expansion unknown] units. For example, in 1978 26,000 tons of mixed feeds were produced from the grain forage of participating farms, or 54.1 percent, and the figures for the first 6 months of 1979 were 7,000 tons, or 15.2 percent of the total volume of output. Because of the lack of orders on the part of participating farms for the production of mixed feeds, the interfarm enterprises are looking for other ways of using the capacities of mixed feed shops and of providing employment for the

workers. They have been concluding contracts with enterprises of the republic administration for hulled and milled products to manufacture mixed feeds from the raw materials furnished by the state. In 1978 they manufactured for them 22,000 tons of mixed feeds, or 45.9 percent of the total volume of production, and in the first 6 months of 1979 the figures were 39,000 tons (84.8 percent).

Organizations of the hulled and milled products administration do not make reimbursement to the interfarm enterprises for the costs involved in processing the grain forage, nor the planned accumulation envisaged in their production and financial plan. As a result many of them are operating at a loss, and they do not have money to repay loans of Gosbank and to build up economic incentive funds.

In 1978 interfarm enterprises failed to receive 136,000 rubles of proceeds in manufacturing mixed feeds for the hulled and milled products administration. For that reason such interfarm enterprises as Vurnarskoye, Krasnoarmeyskoye, Urmarskoye and certain others have ended up being indebted to the state on the basis of a long-term Gosbank loan. Nor were they in a better situation in 1979. In the first 6 months of 1979 interfarm enterprises failed to receive 170,400 rubles of proceeds in their mutual relations with the hulled and milled products administration. And after all, Gosbank loans comprise 79.4 percent of the value of the fixed capital of our enterprises. In 1979 they were supposed to repay 300,000 rubles, and in 1980 437,200 rubles. This averages 5-6 rubles per ton of output. By working for the hulled and milled products administration, then, the interfarm enterprises are unable to improve their financial situation and repay loans to the state. In addition, the hulled and milled products administration is really standing in the way of using such sources for enrichment of mixed feeds as grass meal, tail meal and meat and bone meal, as well as premixes, since it does not reimburse the enterprises for the value of these additives.

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REGIONAL DEVELOPMENT

RECOMMENDATIONS FOR EAST SIBERIAN AGRICULTURAL DEVELOPMENT

Moscow LITERATURNAYA GAZETA in Russian 4 Feb 81 p 11

[Article by A. Markov, senior scientific associate at the Institute for the Far East of the USSR Academy of Sciences: "May Siberian Land Never Grow Scarce!"]

[Text Recently, after many years absence, I again visited Eastern Siberia and the places where I was born and in which I spent my youth. What amazed me was the scale of the work which was being carried out on the middle and upper reaches of the Lena River.

The process of conquering Siberia, of making a place in its midst for man armed with modern technology, almost inescapably entails certain natural but negative phenomena. Thus, work linked with deepening the navigation channel of the Lena River is destroying the bygone beauty of its broad reaches and shores: now strewn along them are tremendous piles of boulders and sand piled up in disordered fashion by the channel excavation machinery. Movement of powerful ships along the river has led also to pollution of its waters and to the loss of young fish who are cast upon the edge of the shore by the wake waves--to a reduction of fish resources.

Particular damage is being done to the Lena River area by the activity of logging enterprises. Over recent years, very many of them were created there. Our timber resources are great and their utilization for the needs of our national economy is both expedient and justified. The pity is that the timber is being felled through the violation of existing rules.

Timber felling plans, which the loggers strive to overfulfill, do not always coincide with the possibilities for their transport. As a result, tens of thousands of cubic meters of valuable wood either lie there in the forest or at storage spots, inasmuch as the possibility of their being transported to other regions of our nation by water or via the sole railroad which is available to us for the time being is limited.

As a result of the thoughtless reduction of watershed forests, the Kuta River and other tributaries of the Lena (where active timber felling is going on) are drying up. The real danger exists that a 300-km stretch of the Lena River, this from Osetrovo to Kirensk, may become too shallow for navigation. It is not difficult to conceive what heavy consequences this would have as to the mastering of this

region. I therefore think it expedient that the following be inserted in Chapter 9 of the Basic Trends draft: "That strict control be exercised over the fulfillment of laws and statutes regulating the procedure for industrial procurement of timber, to see to the rational conduct of timber-felling work and the obligatory protection of watershed forests. Indemnity for damage which might be sustained by the national economy as the result of violating rules for the protection of natural resources should be sought from the economic organizations involved, together with determination of the material responsibility of executives guilty of such action."

Anxiety is also evoked over the status of affairs as to the expansion of agriculture in the Lena River area. The population of this region continues to increase while the productivity of agricultural production continues to decrease.

This situation serves to contrast that which existed in the Lena River area comparatively recently. On the rich lands watered by the curves of the Lena and on the lands won from the tayga excellent harvests of vegetables, barley and good grades of wheat are grown which, in better years, yield 30 to 35 hundredweight per hectare. The fields are well worked, while flood plains and other meadows, including those located along the small tayga rivers, are always mowed on time. There was always enough grain, milk, meat, fish and vegetables, with enough left over for export to the Northern regions.

Now, the situation has gotten worse. For the most part, the population purchases its bread, meat, dairy and other products in stores. The sovkhos which was created in Markovo to provide meat and dairy products is operating poorly. It is failing to provide the growing population with food products, which then have to be brought in over long distances. Individual farm organizations are running down. Many people (particularly our youth) simply do not wish to tie themselves down to caring for cattle and prefer to take advantage of the store services offered them.

There is of course an objective factor for the drifting away of the able-bodied local population--construction of the Baykal-Amur Railroad Trunkline plus the logging outfits, while the rapidly progressing water transport system has led to the abandonment of towns and villages along the Lena. Even though a variety of agricultural equipment has made its appearance in our fields, a considerable portion of our good and arable land is being poorly worked, has become choked with weeds or has been abandoned. There has been no proper organization of the procurement of forest gamebirds, berries, mushrooms, cedar nuts and other "gifts of the forest" in which the tayga is rich, or of the fish available in rivers.

Things are not going well with agriculture in other areas of the Lena River basin also. In the course of his trip to Siberia and the Far East in 1978, CPSU Central Committee General Secretary L. I. Brezhnev mentioned the fact that Irkutskaya Oblast should be supplying itself with animal husbandry products and vegetables. He had in mind also utilization of the natural riches of Eastern Siberia, in which the Ust'-Kut-Kirensk Region (which we have already mentioned) occupies a very important place. I propose that the following be added to Chapter 5 of the draft Basic Trends: "That particular attention be devoted to the development of agricultural production in those areas of Siberia and the Far East which are being intensively developed and that a simultaneous effort be made for the maximum and rational utilization of the food resources of rivers, lakes and forests, this for the purpose of supplying the local population."

IMPROVED INTERSECTOR PLANNING NEEDED IN MEAT INDUSTRY

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 2, Feb 81 pp 65-69

[Article by N. Mymrikov and V. Uzun: "Improving Planning in the Meat Subcomplex of the Agroindustrial Complex"]

[Text] The target-program approach to the planning and management of the agroindustrial complex presupposes identification within it of intersector product subcomplexes. Each of them is satisfying the needs of society for certain end products.

One of these intersector product subcomplexes is the meat subcomplex, which comprises an integrated system of sectors and subsectors in the raising of livestock and poultry, in the meat industry, in feed crop production, in the mixed feed and microbiological industry, in machinebuilding for these sectors, in trade and in other production operations and organizations of the agroindustrial complex, which are united by a common task--satisfying society's needs for meat and meat products.

Participants in the process of the production and distribution of meat and meat products include scientific research and project planning institutes, design offices for the project planning of livestock-raising facilities and a number of enterprises belonging to the meat subcomplex of the agroindustrial complex; construction organizations; enterprises building machines for livestock raising and feed crop production, the mixed feed industry, the microbiological industry and the meat industry; specialized transport; enterprises and organizations for material and technical supply, repair and servicing the facilities of the subcomplex; specialized educational institutions and vocational and technical schools for training personnel for all the sectors within the subcomplex; kolkhozes, sovkhoses, inter-farm and agroindustrial enterprises and associations, subsidiary farming operations of industrial enterprises and individuals; breeding stations and veterinary services; enterprises in the procurements system and the mixed feed, microbiological and meat industries, packing plants, wholesale depots of the meat and fish trade office, and retail trade enterprises.

In addition to these, many other sectors of the economy are indirectly involved in meeting the country's needs for meat and meat products in that they deliver means of production, energy and information to these participants. Only the coordinated activity of all participants will make it possible to obtain the maximum amount of the end product in the appropriate assortment and at a high level of quality.

The meat subcomplex of the agroindustrial complex is important to the national economy because it delivers the most valuable foodstuffs, products which have a high content of animal protein, indispensable amino acids, and so on. According to the data of an intersector balance of labor expenditures in 1972, the production of meat and meat products had a share of 27.9 percent in the total work force of the country's food complex and 32.2 percent of the farm work force.

Consistent application of the target-program approach to planning the production and distribution of meat and meat products presupposes the drafting of an interconnected system of measures embracing all stages of the process of reproduction and ensuring attainment of the goal which is set. The resources allocated for achieving that goal must be distributed so as to ensure proportionality among all stages and must orient all participants in production toward attainment of maximum final results. It is on these premises that we offer below an assessment of the present situation and of directions for improvement of the planning of the production and distribution of meat and of manufactured meat products.

The system that has taken shape for planning these processes is characterized by the following features: in each sector and each stage of the process of reproduction intrasector plans are compiled, and balances of the utilization of the output of each sector are compiled in order to link the intrasector plans to one another.

Since planning does not adequately cover the interconnections in development of related sectors and production operations, disproportions come about between them. For example, proportions are not planned between the products requiring storage and the capacities of storage facilities, between the production of the end product and effective demand for it, and so on.

Annual planning balances of production and use of livestock feed presuppose full satisfaction of the need for feed and creation of emergency stocks. But there is not enough feed. The severe shortage is accompanied by a simultaneous overconsumption per unit of output produced.

This is occurring for the following reasons.

First of all, the plans regularly incorporate standard rates of feed consumption which are too low. For example, for Moldavian SSR the 1975 plan envisaged a feed consumption of 9.4 quintals of fodder units per quintal of feed. In actuality 11.1 quintals of fodder units were consumed. In the 1977 plan the standard allowance was depressed even more--8.45 quintals of fodder units. The actual feed consumption was 10 quintals of fodder units. In the 1978 plan an allowance of 8.46 quintals of fodder units was projected. On the average over the 1975-1978 period the planned consumption of feed in beef production was set 716,100 tons of fodder units, or 15.1 percent, below actual consumption.

The yields of grain-forage and fodder crops are set too high in plans. On the average over the 1975-1977 period the actual yield in Moldavian SSR was 15.3 percent below the planned yield for grain, 29.7 percent low for corn, 40.9 percent low for corn silage, and 30.2 percent low for annual grasses used as green feed.

Incorporating into the plan feed allowances which are too low and yield levels which are too high actually causes a livestock feed shortage amounting to 20-25 percent of the requirement.

Feed crop production is subject to sharp fluctuations from year to year because of weather conditions. The actual yield in unfavorable years is between one-half and two-thirds of the planned yield. In such years the feed shortage increases. For example, in 1976 the planned gross harvest was 1.8-fold the actual harvest for corn, 2.1-fold for winter barley and 2-fold for hay of perennial grasses. In order to maintain the livestock population the feed allowances are often dropped to a level that barely maintains the animals. This sharply increases feed consumption per unit output, and the average annual productivity of the animals drops substantially.

In our opinion the way out of the situation that has come about is to build up reliable reserves of feeds. However, plans envisage only very small emergency stocks of coarse and succulent feeds (10-15 percent of the requirement) as well as of concentrated feeds (8-10 percent). The amount of livestock feed produced varies from year to year. In addition, because of the shortcomings in planning indicated above, even these small reserves are not built up in many cases.

Exaggerated amounts of state grain purchases are planned for individual farms and regions. In accordance with the planned (and especially above-plan) purchases, that portion of grain which is indispensable to the needs of livestock raising is carried away from the farms. Later, because of the shortage of feed, this grain is in part returned to the farms in the form of loans or through market channels. Its price turns out to be several times greater than the production cost, and this is reflected in the production cost of the meat product.

A further increase in the population of livestock and poultry is planned when there is not enough feed for the existing population. After all, the growth of production and stocks of feed in the proper assortment and quality must take place faster than the growth of the livestock population.

Mention also needs to be made of the substantial disproportions between the amount of grain allocated for forage purposes and the capacities of the mixed feed industry and between the microbiological and mixed feed industries. In this connection a sizable portion of the grain is fed without processing and mixed feeds are being produced which have not been balanced by the addition of proteins and vitamins.

One of the reasons for sizable losses of feed is that the capacity of existing storage facilities does not correspond to amounts of feed to be stored. As a consequence these losses are not uncommonly charged to livestock raising.

In the plans the meat industry's development is linked to the input of raw materials for processing. In actuality a sizable portion of the livestock and poultry raised does not go to industrial processing on schedule because enterprises in a number of the country's regions lack the capacity. This means that livestock is held up in yards and in kolkhozes and sovkhozes, and there are losses in the volume represented by that livestock.

In recent years there have been violation of proportions between the growth of the livestock population and construction of new structures for housing livestock. New construction has outstripped the growth rates of the livestock population, even though existing structures were not filled to capacity. For example, as of 1 January 1979 the country's kolkhozes and sovkhozes had about 2 million vacant spaces for cattle in standard permanent structures, 9.8 million vacant places for hogs and 25-30 percent of poultry space was vacant.

At the same time we should note that structures unfit for use were housing 1.2 million head of cattle and a sizable number of sheep and hogs. Structures classified as poorly adapted were used to house 14.3 million head of cattle, 3.2 million hogs and 25.4 million sheep.

This results in violation of optimum proportions in distribution of capital investments. The bulk is going for new construction and to increase the livestock population, while at the same time the volume of capital investments committed to developing sources of livestock feed is altogether inadequate.

Subsidiary farming operations of individuals are an important source of meeting needs for meat. But the production and distribution of the products of this sector are for all practical purposes not covered by planning. Planned regulation of production in the private sector presupposes that its activity is coordinated by the socialized farms.

An analysis shows that the scientifically sound level of meat consumption has not been attained in our country, nor is the recommended assortment of meat products offered to the consumer. In addition, there are sharp fluctuations in product deliveries to trade from month to month and from season to season of the year. These fluctuations in market stocks of meat and meat products conform to this basic pattern: incoming amounts increase in the last month of the quarter and drop sharply in the first month of a following quarter, there is an abrupt dropoff in the size of market stocks between December and January, and the amounts arriving increase from the first to the last quarter of the year.

The marked seasonal nature of meat production is explained by shortcomings in planning and in monitoring of plan fulfillment. Every year higher amounts of meat purchases are planned. Policy-making authorities require that farms fulfill these plans from quarter to quarter. So at the end of the quarter they deliver not only livestock that is conditioned, but also emaciated livestock, which undermines the branch's future development. In regions where the meat sales plan is overfulfilled, the seasonal pattern takes this form: at the end of the year (or the quarter) livestock is kept too long, processing volumes drop off, and at the beginning of the year (or the quarter) there is a sharp increase in the output of meat.

Sharp fluctuations in output are reflected in sales of meat and meat products. The unevenness of supply gives rise to a shortage, prices rise sharply on the kolkhoz market, and so on.

The inadequate level of production of meat and meat products when personal income has been rising rapidly has created a shortage of meat and meat products and a demand that substantially exceeds the supply. The rise of prices on kolkhoz markets

and their relations to prices in state trade indicate that there is a shortage of meat products and that this shortage is increasing systematically.

Relations between the various sectors and production operations in the meat subcomplex are now governed by a number of normative documents which have not been sufficiently coordinated with one another. Plans for improvement of the economic mechanism, which are supposed to orient all participants in production toward final result, are not being compiled. For that reason the interests of those involved in production and distribution of the final product are inconsistent with one another to a great extent. For example, participation in the production of the subcomplex's final product results in losses for kolkhozes and sovkhozes, while sizable profits are realized by enterprises which fatten livestock, by meat-packing combines, and by trade-and-sales organizations.

Plans governing distribution of capital investments and materials and equipment are compiled by sector, but they do not take the ultimate goal of production as their point of departure. They do not analyze, nor do they plan expenditures of labor and funds to produce the end product, nor do they identify the portion of expenditures attributable to the various stages in the process of reproduction and the individual sections of production.

The absence of the target-program approach to planning is the overall reason for the shortcomings in planning the production and distribution of the end product of the meat subcomplex enumerated above.

It would seem advisable for plans of the country's economic and social development to include a section entitled "Agroindustrial Complex," in which there would be a subsection entitled "Planning the Production and Distribution of Meat and Meat Products."

The target approach, the comprehensive approach and the program approach are the methodological foundation for drafting this subsection of the plan.

The target approach establishes the goal which has been set--the level of satisfaction of the needs of the public for meat and meat products--as the point of departure in compiling the plan for production and distribution of these products. All participants in production must work to achieve that goal.

The comprehensive approach presupposes that a single program covers all stages of the process of reproduction, beginning with scientific research and ending with consumption of meat and meat products. The plan must envisage measures to improve the economic mechanism in order to ensure that all participants are motivated to carry out the program which has been outlined and that all their actions are coordinated.

The program approach envisages the system's passage from the actual state to the desired (planned) state by drafting a list of measures that are interconnected and that are mutually adjusted in terms of time. It is indispensable that all shifts in the qualitative and quantitative indicators of production and distribution of meat and meat products be planned as a result of specific measures. Resources for

development of production and the anticipated benefit should also be determined on the basis of the measures contained in the program.

The most important groups of indicators for planning the meat subcomplex of the agroindustrial complex are the following:

1. Indicators of the level of satisfaction of the needs of the public for meat and meat products (as a whole, with respect to assortment, and by periods of the year). This group of indicators should be planned so that the production of meat and meat products as a whole and by individual items in the assortment correspond to the optimum standard; so that relations are observed among the types of meat (beef, pork, mutton, poultry meat and other types of meat); so that the public has a uniform supply of meat and meat products during the year (as a whole and by items in the assortment for the months of the year); so that the supply of meat and meat products corresponds to effective demand. Balance must be achieved between the value of meat and meat products to be sold to the public and the total amount of each family's real income being set aside to purchase those products. This can be achieved by altering the amount of meat to be sold, its quality, the composition of sales, retail prices or personal income.

2. Amounts of the subcomplex's end products: products of the slaughtering of livestock and poultry on farms which do not go through industrial processing; products of the meat industry--meat and edible offals in Category 1 (beef, pork, mutton, poultry meat, horsemeat, rabbit meat, other types of meat, edible offals in Category 1), sausage products (cooked, semicured, hard cured, fresh links, small fat sausages, smoked sausages and other types of sausage products), meat products (rendered lard, chops, meat dumplings, ground meat, partially prepared products, meat stuffing for sausages, and meat mixture), miscellaneous products of the meat industry, canned goods, livestock feeds of animal origin sold outside the subcomplex, hides, down, feathers, and so on.

These indicators are calculated on the basis of data on the planned level of consumption, to which are added growths of stocks, the net result of exports and imports, and also those end products and their amounts which are used for productive consumption outside the meat subcomplex of the agroindustrial complex.

3. Indicators of the economic efficiency of the production and distribution of the end product. For the subcomplex as a whole and in the breakdown of individual groups and types of end product the following should be planned: the value of the final product (in prices of final consumption), total (national economic) outlays of money and materials, the size of the work force and expenditures of labor in all sectors of the meat subcomplex, the value of fixed and working productive capital, amounts of capital investments, total (national economic) income of all participants in production. On the basis of these indicators one computes the planned figures for labor productivity, the output-capital ratio, and the efficiency of capital investments for the subcomplex as a whole and for individual types and groups of the final product.

The most important intersector proportions in the meat subcomplex are proportions between feed crop production and livestock raising; between growth of the livestock

and poultry population and construction of new housing and reconstruction of livestock housing; between production of weight gain of livestock and poultry and the capacities of the meat industry; between production of and the need for machines used in livestock raising, processing equipment and other means of production; between the amounts of intermediate and final products needing storage and the available storage capacities; between the amounts of project planning and design work and scientific research work and measures for scientific-technical progress, for new construction, and so on; between the number and occupational makeup of personnel being trained and the need for specialists and skilled workers.

Within plans provision must be made for balance-sheet calculations of the production and use of all final and intermediate products. Both production capabilities and also full utilization of output linked to capacities for processing it, for storage, and so on, should be taken into account in compiling the balance.

Proportions between amounts of livestock feed to be stored and the capacities of storage facilities should be established so as to ensure full preservation of the yield and emergency stocks of feed being carried over in favorable years. Proportions between amounts of livestock and poultry deliveries for processing and the capacities of the meat industry and between the products to be stored and capacities of packing plants must be established so as to ensure timely processing of livestock and poultry and uniform supply of meat and meat products to the public throughout the year.

It is best to allocate materials and equipment and labor and financial resources for the comprehensive program as a whole. The distribution of these resources among the sectors and participants in production should be aimed at correcting the disproportions that exist and at interlinked development of all stages of the process of reproduction so as to take into account the efficiency of utilization of resources. The growth of the volume and efficiency of production of the final product is the criterion of the optimality of resource allocation.

The planning of intersector proportions is based on numerous standards pertaining to need for and consumption of products and resources. It is indispensable to use the program approach in projecting standard costs and standard outputs. Actual rates are taken as the basis of calculating standards for the future. All changes in the standards are justified by relevant measures which will be taken to achieve the goal. Each specific measure contained in the program is characterized by specific outlays of resources, by the results that will accrue from its accomplishment (higher output, reduction of inputs of resources), by the scale on which it is possible to apply the measure, by the period of time it will be carried out, and by a description of the conditions that permit this measure to be applied. The sum total of programmed measures should ensure the transition from the present level of satisfaction of the public's need for meat and meat products in the appropriate assortment and quality to the intended level over the projected period in the future.

The principal directions for improving the planning of production and use of feed in the meat subcomplex are the following:

i. planning the population of livestock and poultry which can realistically be assured a full supply of feed on the basis of feed production in the current year and available stocks even in unfavorable years. The growth of the livestock population should be planned on the basis of realistic feed resources;

ii. use in planning computations of realistic rates of feed consumption per unit of the meat product and a fully substantiated increase in the yield of grain-forage and fodder crops;

iii. planned creation and replenishment of the necessary livestock feed reserves. Calculations show that in view of the substantial impact which climatic factors have on the results of production it is indispensable for plans to envisage creation of stocks of livestock feed sufficient to offset possible deviations of the actual yield from the planned yield;

iv. adjustment of figures on the volume of state purchases of forage grain so as to take into account the specific conditions of the year so that the farms are able to build up a forage stock in unfavorable years and replenish stocks of forage in favorable years.

It would seem advisable not to undertake administrative and economic measures that result in above-plan state purchases of forage grain on those farms where the remainders are inadequate to ensure feed for the farm's own livestock-raising operations. Herds of productive livestock and poultry must be furnished feed in accordance with feed allowances in all periods of the year.

Five-year and annual plans governing the production and distribution of meat by regions of the country must be realistic so as to ensure every year the accomplishment of deliveries to union and local stocks. It is indispensable in this connection to take into account that exaggerated purchase plans ultimately result in an excessive hauling of meat out of the regions where it is produced and difficulties in supplying meat products to the local population. This sharply increases cross-hauls, not to mention the adverse social consequences of this oversight in planning.

In order to eliminate seasonal fluctuation in meat production and consumption, futures contracts should envisage month-by-month commitments for the delivery and acceptance of livestock and poultry, should establish economic penalties both for underdelivery of livestock and poultry by the dates set in the contracts and also for delivery of an excessive amount of livestock in periods when enterprises of the meat industry have their peak loads.

To ensure balance between the demand and supply of meat and meat products it is advisable to differentiate meat prices as a function of grades, making provision for higher prices on high-grade products. Meat should be packaged by grade at enterprises of the meat industry. Provision should be made for more thorough processing of meat, for increasing the share of intermediate meat products, smoked goods and other products of high quality that have a higher price. This will make it possible to augment the value of the end product of the meat subcomplex obtained from the same raw material resources. It is also indispensable to accord kolkhozes,

sovkhozes and interfarm enterprises the opportunity to sell meat they have produced over and above the plan through the system of cooperative trade (at higher prices) as well as on kolkhoz markets (at the prices that occur on those markets).

At the present retail prices the value of meat, sausage products and canned meat products sold through state and cooperative trade was 18.3 billion rubles in 1978, or less than 15 percent of the total value of food commodities. As noted above, the relative share of meat and meat products in expenditures of labor for food is almost twice as high.

There is a need to improve the planning of the production and distribution of meat on the personal subsidiary farms of individuals. Plans should make provision for the volume of production on those farms, for their supply of materials and equipment, for their adequate supply of livestock feed, of small machines and machinery, of equipment, of young animals, and so on. It would be best to base the production and distribution of the products of private farming on futures contracts with kolkhozes and sovkhozes. In our opinion product sales from private farms of individuals should be included in the plans of kolkhozes and sovkhozes, and an effective system should be worked out for stimulating the production and sale of the products of these farms.

Retail prices of final products, purchase prices of livestock and poultry, rate schedules for payment of procurement activity, wholesale prices of the products of the mixed feed, microbiological and meat industries, trade-sales deductions, prices of machines and equipment for livestock raising, the cost of livestock-raising and other production facilities to be built, state subsidies, the procedure and proportions of transfers to material incentive funds for all participants in the production and distribution of the final product should be worked out as components in a single system so as to take into account the present cost proportions and proportions of accumulation necessary for expanded reproduction. As this is done, all participants in production must be accorded equal motivation to increase the volume and improve the quality of the final product.

The practice of target-program planning necessitates creation of the relevant intersector system of information for the agencies making decisions in planning and managing the meat subcomplex of the agroindustrial complex. This system must contain a full description of the volume and value of the final product, of national economic costs, income and production efficiency and of sales of individual product groups and products.

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IMPROVEMENT OF AGROCHEMICAL SERVICE CALLED FOR

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[Article by V. P. Nikonov, chairman of the Soyuzsel'khozkhimiya Association, USSR minister of agriculture: "Improving the Agrochemical Service"]

[Text] The country's agriculture is faced with important tasks under the new 5-year plan. The plan of the CPSU Central Committee for the 26th party congress, "Basic Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period up to 1990," envisions during the 5-year plan increasing the average annual production of agricultural products by 12-14 percent and labor productivity in the public economy by 22-24 percent, and providing for an all-around increase in the fertility of the soil and productivity, as well as the production of grain, feeds and other products. The all-union Sel'khozkhimiya Association which was created in keeping with the July (1978) Plenum of the CPSU Central Committee is called upon to play a large role in carrying out these tasks. It must assume full responsibility for scientifically substantiated and efficient utilization of mineral and organic fertilizers, pesticides, growth substances and other means of chemization of agriculture on all kolkhozes, sovkhozes and other agricultural enterprises.

There are 3,007 rayon and interrayon as well as 154 oblasts (kray) associations that have been created and are operating in the country, and production-scientific associations have been organized in all of the union republics. They have taken over 206 agrochemical laboratories and design-research stations, 152 plant protection stations, and 12 scientific research and planning-design institutions. There are about 400,000 people working in the system of the agrochemical service and more than 42,000 of them are specialists and scientists. Enterprises of Soyuz Sel'khozkhimiya have taken over 100,000 tractors, as many trucks, more than 450,000 units of special technical equipment, and storehouse facilities that can handle 9.7 million tons at one time.

During the first year of its operation the agrochemical service fulfilled the work plan for 6.1 billion rubles. The chemical workers assumed all the responsibility for extracting local materials containing lime and gypsum, 90 percent of the work for applying lime and gypsum to the soil, 60 percent of the work for extracting peat, 42 percent for shipping organic fertilizers, and 25-28 percent of the work for applying mineral and organic fertilizers and applying means of plant protection. Our associations are also responsible for supplying the farms with other fertilizers, pesticides, preservatives, feed supplements and other chemical products.

Increasing the fertility of the soil, naturally, is a key factor in our work. This work has been organized especially well in the Belorussian SSR, the Lithuanian SSR, the Moldavian SSR and the Kirgiz SSR. Chemical workers are gaining more and more authority among the farmers in Krasnodarskiy Kray, Bashkiriya and Tatarsiya, and Pekovskaya, Voronezhskaya, Tambovskaya, Saratovskaya, Ul'yanovskaya, Voroshilovgradskaya, Vinnitskaya, Khar'kovskaya, Ashkhabadskaya, and Maryyskaya oblasti. The situation is not as good in Armenia, Uzbekistan, Azerbaijan and the Ukraine.

With the current rates of development of productive forces in the country's agriculture, the significance of chemization increases from year to year. Under the 10th Five-Year Plan, in the overall system of factors that determined the yield of agricultural crops, the proportion of chemization reached 50-60 percent, and in many enterprises, rayons and republics this indicator was even higher. The application of fertilizers produces a stable increase in the yields, especially of grain and cotton. The highest additional yields of grain (9 kilograms) from each kilogram of nutritive substances in 1966-1980 was obtained in the regions of the Northern Caucasus, the Volga area, the Central Chernozem and Kazakhstan.

In 1980 the amount of active substance of fertilizers delivered to agriculture, had increased three-fold as compared to 1965. The application of organic fertilizers increased from 363 to 809 million tons, and the volume of work for applying lime increased two-fold in terms of area and four-fold in terms of the utilization of lime. The assortment was expanded and the quantity of pesticides increased, especially -- herbicides, which became a good basis for the introduction of industrial technology for the cultivation of a number of agricultural crops.

Agrochemical science has made significant progress. In the country as a whole a second cycle of agrochemical examination of the soil has been completed, and scientific fundamentals of plant nutrition and efficient time periods and methods of applying fertilizers have been developed. And the labor of chemical workers is responsible to no small degree for the fact that under the last 5-year plan the average annual grain yield in the country exceeded 200 million tons.

But in summing up the results of the 10th Five-Year Plan it should be noted that far from all reserves for the chemization of agriculture were utilized. And now, when a decision has been adopted to develop a special food program which envisions increased productivity of all crops and making our farming more stable, it is necessary to take all measures so as to put all existing possibilities into use.

Perhaps the most important of them is a thrifty and economical attitude toward material and technical values. With respect to each oblast and republic it is possible to give several examples of inefficient utilization of chemicals. The system of supply of fertilizers is still arranged in such a way that many kolkhozes and sovkhozes do not have the opportunity to apply them at the best time and complete the complex according to the figures on cartograms. Unfortunately, a situation frequently arises wherein certain farms have a surplus of nitrogen but no phosphorus or potassium while as for others it is the reverse. Farms located next to supply bases frequently receive 1.5-2 times more fertilizers than they should while more distant ones fail to receive as much as half of the amount allotted.

The fact that workers of agrochemical laboratories and chemization stations are not exercising strict supervision over the implementation of developed recommendations is also reflected here. Ways of eliminating these shortcomings include both strengthening of the material and technical base for chemization and improving economic incentives. There are also still points where fertilizers are unloaded practically on the ground next to the tracks. There is an especially unfavorable situation in many oblasts and rayon associations of Rossel'khozkhimiya, for example, in Ryazanskaya, Volgogradskaya, Penzenskaya, Permanskaya and Sverdlovskaya oblasts. We must put an end to this kind of this mismanagement under the new 5-year plan. Moreover we are speaking not only about the construction of storehouses and unloading areas but also about correct organization of the storage of fertilizers and the supply of them to the farms.

In 1981, 87.5 million tons of fertilizers will be delivered to agriculture. They must be utilized with maximum advantage. Special attention should be devoted to the application of complex fertilizers and granulated superphosphate as starter and interrow fertilizers. In all zones we should extensively introduce local methods of application. So far they are being used on limited areas even though they produce the greatest effect.

Providing industrial technology for the cultivation of agricultural crops with a complete complex of fertilizers and herbicides should be a subject of special concern for our subdivisions.

In 1981 the areas planted in corn and cultivated according to new technology will increase appreciably. And, as was recommended, no less than 330 kilograms of fertilizers, weighted dose, should be applied to each hectare. This guarantees (with strict fulfillment of other measures) a yield of 70-75 quintals per hectare, and, with irrigation, 120-130 quintals per hectare. Serious attention should also be devoted to other crops that are raised according to new technology: rice, cotton, sugar beets, soybeans and sunflowers.

A significant factor that retards the increase in productivity and reduces the effectiveness of mineral fertilizers is the large quantity of acid, solonchaks and saline soils. These lands must be chemically improved and the reaction of the soil environment must be brought up to the optimal level. More attention should be devoted to applying phosphorites to the soil--a device that makes it possible not only to increase the phosphorus content in the soil, but also to reduce its acidity. An important reserve for increasing the production of grain and feeds, but a reserve that is being poorly utilized, is agromeliorative cultivation and the application of gypsum to solonchak soils.

In the associations there are still quite a few problems related to providing technical equipment, improving forms of labor organization, and introducing new methods and means of mechanization of utilization of mineral fertilizers. During the course of the pre-congress competition the collectives of enterprises are persistently resolving these problems and are reaching a point where even during the first year of the 11th Five-Year Plan, the plan high level of yield was supported by all the necessary components of fertility.

The complete staff of the plant protection service has joined Soyuzsel'khozkhimiya. Throughout the entire country it has a ramified network of

stations, laboratories, and signalization and prognostication points, with an overall number of about 29,000 workers, including 15,000 specialists. Their functions are to organize work, provide methodological guidance, exercise control over measures that are conducted, develop predictions of the appearance and development of pests and diseases, and train personnel working in detachments and teams for plant protection. The role of this service is very significant since loss of the crops from pests and diseases can not be compensated for by any other technological means than skillful and correct utilization of comprehensive methods and systems of plant protection.

Last year work for protecting planted areas and plantings was conducted on 151 million hectares, including work against pests and diseases on 80.4 million hectares (15.3 million of these hectares using the biological method), and against weeds--on 65 million hectares. Defoliants and dessicants were applied on 5.5 million hectares. All this made it possible to save a total of 8 million rubles' worth of products.

One should take note of the good work of the Chernigovskaya, Krymskaya, Krasnodarskaya, Kustanayskaya and Kokchetavskaya plant protection stations, the Ural'skaya expedition, and the entire plant protection service of Moldavia which has skillfully organized their work and contributed to the introduction of new industrial technologies for the cultivation of corn, sunflowers, soybeans, and other crops.

Special support should be given to the expansion of the volumes of biological methods of fighting against pests. Thus in Kashkadar'inskaya Oblast, 46.5 percent of the overall volume of protection work is performed by the biological method, and in Namanganskaya--58.7 percent, which made it possible to sharply reduce chemical treatment.

Still there are quite a few difficulties in the organization of the fight against enemies of the crops. One of them is the poor supply of pesticides. With the present level of mineral nutrition--90 kilograms per hectare, weighted dose--it is necessary to have at least 30 kilograms of pesticides per ton of active substance, but we receive only 12.5 kilograms.

Last year herbicides were applied to 45 percent of the spike crops and cotton, 37 percent of the sugar beets, 48 percent of the soybeans, 16 percent of the sunflowers, 2 percent of the pulse crops and 31 percent of the vegetable crop. This is far from all of the area that requires chemical treatment. As a result, many fields are very weedy and the return from mineral fertilizers applied to the soil is low. And the most disgraceful thing is that some of the blame for this situation lies with the workers of the service itself who did not manage to organize prompt and effective utilization of existing resources in several zones of the country. Thus the herbicides allotted in 1980 were sufficient to treat 80 million hectares and 15 million hectares less than this were actually treated. So much valuable product output was lost because of this!

Means of plant protection are distributed among the storehouses of the kolkhozes and sovkhoses. During preceding years hundreds of tons of leftovers accumulated in them, losing their potency, and they also serve as a source of pollution of the environment. Just one example. On the Kreser Aurora Kolkhoz in Shakhoskiy Rayon

in Moscow Oblast, more than 10,000 tons of the most diverse kinds of fertilizers were "stored," if you can call it storage, indiscriminately in a heap in a primitive storehouse. Large quantities of leftover toxic preparations have accumulated on certain farms.

Unfortunately, there are not just individual cases of this terrible attitude toward pesticides.

There are also a number of Sel'khozkhimiya associations that do not pay attention to storing chemical means of plant protection at their own specialized bases. The preparations are kept in makeshift facilities, without divisions into groups and sections, in violation of the rules for fire safety. Cases like this have been discovered, specifically, in the Zernogradskiy and Yegorlykaskiy rayon associations in Rostovskaya Oblast, the Zergerskoye and Annauskoye associations in the Turkmen SSR, and the Kungurskiy and Permskiy interrayon associations in Permskaya Oblast. There is poor local control over the quality of preparations that are delivered to agriculture. It would seem that under the conditions of a consolidated specialized chemization service there would be every possibility of changing this. But the situation is being rectified slowly and subdivisions of our service are acting separately.

It is known that the kolkhozes and sovkhozes are poorly supplied with sprinklers, dusters (only by 60 percent) and machines for treating feeds (67 percent). Under these conditions great hopes are being placed in the fact that even in the first year of its existence Sel'khozkhimiya associations are stepping up assistance to the farms. But the volumes of work for plant protection that are being performed by machine operators of the associations are not that great: 15 million hectares through their own forces and 16 million hectares with the help of aviation, a total of only 20.6 percent of the overall volumes of treatments. As usual not enough is being done to create solution units and treatment areas. Moreover, the new, highly productive technical equipment for applying pesticides which has been allotted to agriculture continues to go not for strengthening specialized plant protection detachments, but to the kolkhozes and sovkhozes.

Up to this point the kolkhozes and sovkhozes of the country have not introduced mass cartography of the fields for weediness, and orders for herbicides are drawn up blindly, without taking into account the kinds of weeds that exist. By doing this we deprive ourselves of the opportunity of utilizing herbicides in various combinations, and in general we sharply reduce the effectiveness of their application. Recently an association council adopted a decision to curtail the receipt of orders that are submitted without cartograms for weediness, and instructions for accounting for weeds were approved. This work should be done everywhere.

It is time to introduce a strict policy for the organization of protective measures. Workers of the plant protection station must change over from recommendational and methodological functions to organizational work, assuming full responsibility for correct and efficient utilization of all pesticides. There are also many other important problems in the chemization of agriculture. In order to increase the productivity of arable land, it is necessary to considerably expand the application of such means as growth, regulators, nitrification inhibitors, and hydrophobic film-forming materials for coating

feeds. Last year, for example, there were many losses because of lodging of grain. And this could have been avoided by using tur and kampazon preparations which were plentiful. I recall that in the GDR, for example, similar substances were used to treat 45 percent of all the areas planted in wheat, 60 percent of the winter rye and 30 percent of the barley. Here in Belorussia, the Baltic area, the forest zone of the Ukraine and the Nonchernozem zone of the Russian federation are similar to the GDR in terms of climatic conditions, but tur and kampazon are applied only on 8-10 percent of these crops, and the orders for them are decreasing.

In 1981 tur and kampazon must be applied as extensively as possible. For it has been proved that these preparations contribute to improving the planted areas, facilitate harvesting and increase the yields.

Last year in many oblasts of the RSFSR, the Ukraine and Belorussia, on an area of 420,000 hectares, corn was planted with hydrophobized seeds. Good results were obtained everywhere. One would think that this device should be extended to other zones of the country, for it makes it possible to plant the crop practically a month earlier and to obtain considerably more dry substance.

I should like to say a couple of words about our partners--the aviators. Last year the volume of aviation chemical work exceeded 97 million hectares. Civil aviation pilots worked well in protecting the planted areas, in applying the top dressings, defoliating and desiccating. The advantage of a centralized service for aircraft was proved by our subdivisions in the Lithuanian SSR, the Moldavian SSR, the Kazakh SSR, the Tadzhik SSR, and the Turkmen SSR, as well in many oblasts and krais of the RSFSR. It is necessary to expand this practice.

This is not the first year that the agrochemical service has been developing in our country, and a certain amount of experience has been accumulated. We have farm agrochemical points and large complexes of rayon associations which are created on a cooperative basis. And one of the important tasks is to determine which organizational forms should be developed, based on the local conditions of one zone of the country or another, so as to provide for maximum development of comprehensive chemization, increased labor productivity, unconditional reduction of material and labor expenditures per unit of cultivated area and full material incentive for the quality of the work and the final results of the labor--the crop. Special attention should be given to experience of Sel'khozkhimiya agrochemical complexes. They have been created on a state (and in Moscow and Kostromskaya oblasts, the Mariyskaya SSR, Belorussia, the Ukraine and Lithuania) and on a state-cooperative basis (in Belgorodskaya and L'vovskaya oblasts and Moldavia). I shall mention, for example, the Pervomayskiy association in Khar'kovskaya Oblast. It has been in operation for 5 years and serves 13 kolkhozes and 5 sovkhoses with an overall area of 86,000 hectares. The complex includes storehouses for bulk (10,000 tons) and packaged (2,400 tons) fertilizers, lime, phosphate meal (2,000 tons) and has capacities for liquid fertilizers (1,600 tons).

Twelve mechanized teams have been created for performing agrochemical work, and they have 72 tractors and other necessary technical equipment. There are 203 people working here. The complex is fully equipped for unloading and storing fertilizers up to the moment of their application, loading and transporting them to the fields, and performing all the work for applying mineral fertilizers to the

soil and 75 percent of the work for applying organic fertilizers. The elimination of unnecessary transfers of shipments made it possible to cut losses of fertilizers in half. During the 5-year plan as a whole about 9,000 tons of them were saved. Chemicals are used in precisely the given quantity for a planned yield.

The association's activity is strictly coordinated with the work of the kolkhozes and sovkhozes and is under strict control by agrochemists, a position which has been introduced into the staffs of all kolkhozes and sovkhozes. As a result, in 2 years of the 10th Five-Year Plan the yields of grain crops increased by 6.6 quintals per hectare, and sugar beets--by 111 quintals. Such an increase was achieved mainly as a result of efficient utilization of fertilizers and pesticides without a significant increase in the norms of application, which remain within the range of 112 kilograms per hectare, weighted dose.

A decision has been adopted to create a base for storing pesticides as part of the agrochemical complex, and to construct a unit for preparing active solutions, and storehouses for storing feed preservatives, growth regulators and liquid herbicides that are delivered in tanks. Control areas will also be constructed for regulating and inspecting all technical equipment before operation.

An express laboratory is being created in the association for determining the level of nitrogen nutrition of the plants and controlling the quality of agricultural products. Construction is being completed on a point for technical servicing of tractors and other equipment, and it is intended to construct two divisions where mechanized detachments will be deployed.

In the country 3,000 farm and interfarm agrochemical points have been created and are in operation. Thus, for example, the point of the Rodina Kolkhoz in Leningradskiy Rayon in Dneprodarskiy Kray provides for the application of chemical substances on 14,300 hectares, and 64 machine operators work on two shifts here. Valuable experience has been accumulated by the chemization points in Chernigovskaya, Cherkasskaya, Rostovskaya and other oblasts. It is necessary to study attentively the style and methods of their work so as to begin large-scale this year for creating our main production subdivisions. Here it should be taken into account that almost two-thirds of the 47,000 farms have planted areas of from 500 to 4,000 hectares. With these work volumes it would hardly be possible to utilize highly productive technical equipment efficiently, and it will be more suitable to use the Pervomayskiy practice of agrochemical service here, with extensive cooperation of the means of the farms, especially in the construction of landing strips and divisions of agrochemical complexes.

Our young association still has many difficulties. One of them is the difficult situation with technical servicing and repair of machines and tractors. In the 3,007 rayon associations there are only 79 shops for current repair (2.6 percent of the requirement), 650 technical servicing points (21 percent) and 442 automotive garages (14.7 percent). Goskonsel'khoshtekhnika enterprises have taken on some of our machines for technical servicing, but this does not solve the problem. The situation is especially bad in Vologodskaya, Zurekaya, Omskaya, Vitebskaya and Sumskaya oblasts. We are hoping that local party, soviet and agricultural agencies will help in strengthening the material and technical base of Sel'khozkhimiya.

Additionally, the association managers themselves must be more active and display initiative and persistence, the more so since within the system there are still many unsolved economic and legal problems. We have not achieved the proper level of responsibility for exact fulfillment of commitments on the part of many services, especially those that involve unloading and transporting fertilizers. Even now the idle time of railroad cars is double the norm in the Russian Federation, Azerbaijan and several oblasts of the Ukraine. The work of automotive transportation enterprises has not been organized well, and problems of creating our own repair and construction organizations are being solved slowly even though without them we cannot provide for normal development of all of our subdivisions. Labor discipline in the collectives is still weak in some places.

We are seriously concerned about the fact that our main production unit--the rayon association--in many oblasts and krays has not assumed that well-arranged organizational structure which was presupposed and envisioned by the standard table of distribution. A number of services have been unified only on paper, and they have different sources of financing. Budget allocations for chemization and plant protection services come under four articles and nine paragraphs! I think that these are outlays for only the first, organizational year, and that the USSR Ministry of Finance will help us to change the classification of budget allocations and bring them in line with the norm that corresponds to a consolidated service and its tasks.

We need constant assistance from scientists in resolving many problems in the chemization of agriculture and also issues related to the activity of associations.

It will be necessary to develop economically substantiated systems of interrelations among agrochemical subdivisions and kolkhozes and sovkhoses, including measures for increasing mutual material responsibility for prompt and high-quality fulfillment of contractual commitments, scientifically substantiated levels of prices and rebates, and ways of improving the system of wages and incentives for workers of all subdivisions, depending on the yield obtained in the zone of service.

Much must be done to improve the planning and control of the production process. Our service requires the development of a large number of normative documents. We must more persistently improve and introduce into production an automated system of agrochemical examination of soils and the quality of plant products, fertilizers and chemical treatment preparations.

It is necessary to revise the structure of the Central Institute for Agrochemical Service of Agriculture and republic institutes that are part of the association so as to efficiently provide scientific work on questions related to the development and activity of the agrochemical service. Concern is aroused by the fact that a number of union republics have not yet solved the problem of transferring the appropriate scientific research institutions to the republic associations.

One of the most important directions for the work of scientists should be stepping up fundamental research directed toward efficient utilization of means of chemization in the various regions of the country. We have singled out 21 oblasts, krays and republic associations for studying and testing the recommendations of science and have drawn up concrete programs of work for each of

them. In Moscow Oblast, for example, the All-Union Scientific Research Institute of Biological Methods of Plant Protection, the All-Union Scientific Research Institute of Phytopathology, and All-Union Scientific Research Institute of Labor and Administration of Agriculture, the Scientific Research Institute of Vegetable Farming and other institutes have been enlisted in this work. In the Moscow area recommendations are being introduced for applying trace fertilizers, utilizing diagnostic methods for increasing the effectiveness of nitrogen fertilizers, mixing fertilizers, new technology for applying liquid ammonia and many others. A broad program of work has been drawn up for Kaluzhskaya, Leningrad and Voronezhskaya oblasts, the Tatarskaya ASSR and the Moldavian SSR.

Chemization stations and agrochemical laboratories play a special role in the successful operation of the associations. Large skilled labor forces (about 17,000 people) are concentrated here, and they are the connecting link between science and production. They have now entered a qualitatively new stage in their work. Now they must not only provide the farms with scientifically substantiated plans and planning estimates, but also participate directly in the organization of efficient application of means of chemization and perform not only control and recommendational, but also organizational and technological functions. The activity of the associations and agrochemical laboratories should be evaluated in terms of the level of return on means of chemization with the harvest. Today it is not enough to examine the soil every 7-8 years. This time must be cut in half.

It is no longer satisfactory that many of the laboratories still limit their activity to determining just the acidity and the contents of phosphorus and potassium in the soil. Now one cannot control the effectiveness of chemization without taking into account the content of trace elements, magnesium, potassium, sulphur and humus in the soil. Any laboratory can do this. The methods have been developed and they have the instruments. An indispensable requirement of the day is to change over to determining an entire complex of indicators in the soil. This, incidentally, has already been done in the Baltic republics and Belorussia.

The organization of control over the quality of agricultural products is still the same critical problem. This work is largely spontaneous. But this process absolutely must be controlled and our agrochemical service must be in charge of it. Associations of Sel'khozkhimiya, the Tsinao, and the Agropribor association must provide these laboratories with methods, instruments and chemical reagents.

It is necessary to step up control over the quality of chemical products and the observance of standards of conditions for the delivery of fertilizers and pesticides. One would think that agrochemical laboratories should grow into planning and research stations for the chemization of agriculture and that the kolkhozes and sovkhozes should receive from a single service recommendations not only on questions of plant nutrition, but also on their protection from pests, diseases and weeds. The Abkhazskaya ASSR recently began to develop a combined station for plant protection and agrochemistry. This practice should be expanded and studied so that in the next few years we will be able to finally decide what this unit should be.

There should be more concern for personnel, including agrochemists and agronomists specializing in plant protection. Agricultural VUZ's and tekhnikums supply only half of our needs.

We are now in the heat of the struggle for a high yield during the first year of the 11th Five-Year Plan. Devoting their shock labor to the 26th Congress of the Communist Party of the Soviet Union, farmers of the country are striving to do everything possible now so as to prepare for the spring and summer period in an exemplary way. The USSR State Committee for Labor and Wages and the AUCCTU have instituted 35 Challenge Red Banners to encourage leading collectives of associations and organizations of the Soyuz'sel'khozkhimiya system.

And there is no doubt that the workers of our service will make their contribution to the general national cause of increasing the fertility of the soil and the productivity of farming.

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